

This manual includes

- Safety Instructions
- Technical data

ACA 6xx Sections
3 to 4300 kW

These Safety Instructions must be studied before storing, installing, commissioning, servicing and operating the air-cooled ACS 600 MultiDrive frequency converters.



ACS 600 MultiDrive Manuals (Air-cooled Units, English Originals)

GENERAL MANUALS

*Safety and Product Information EN 63982229

- Complete general Safety Instructions
- Technical data for DSU and TSU supplies and Drive Sections: ratings, power losses, dimensions, weights, fuses etc.

*System Description EN 63700151

- General description of ACS 600 MultiDrive

*Hardware Manual EN 63700118

- General Safety Instructions
- Hardware description of the Drive Section
- Cable selection
- ACS 600 MultiDrive mechanical and electrical installation
- Hardware commissioning of the Drive Section
- Preventive maintenance of ACS 600 MultiDrive

ACS 600 MultiDrive Control Electronics LED Indicators

EN 64289721

- LED descriptions

**Modules Product Catalogue EN 64104268

- Supply Unit components
- Drive Unit components
- Dynamic Braking Units
- DriveWare information
- Dimensional drawings
- Single line diagrams
- Auxiliary power consumption
- Master component tables

**Modules Installation Manual EN 64119010

- Cabinet assembly
- Wiring

**Grounding and Cabling of the Drive System EN 61201998

- Grounding and cabling principles of a variable speed drive system

**EMC Compliant Installation and Configuration for a Power Drive System EN 61348280

- * Included with cabinet-assembled systems only
- ** Included in Modules deliveries only

SUPPLY SECTION MANUALS (depending on the supply type one of these manuals is included in the delivery)

Diode Supply Sections User's Manual (DSU) EN 61451544

- DSU specific Safety Instructions
- DSU hardware and software descriptions
- DSU commissioning
- Earth fault protection options

Thyristor Supply Sections User's Manual (TSU) EN 64170597

- TSU operation basics
- TSU firmware description
- TSU program parameters
- TSU commissioning

IGBT Supply Sections User's Manual (ISU) EN 64013700

- ISU specific Safety Instructions
- Main components of ISU
- ISU ratings
- ISU power losses
- ISU dimensions and weights
- ISU fuses
- ISU program parameters
- Earth fault protection options

FIRMWARE MANUALS FOR DRIVE APPLICATION PROGRAMS

(appropriate manual is included in the delivery)

System EN 63700177

- Commissioning of the System Application Program
- Control Panel use
- Software description
- Parameters of the System Application Program
- Fault tracing
- Terms

Application Program Template EN 63700185

- Commissioning of the Drive Section
- Control Panel use
- Software description
- Parameters
- Fault tracing
- Terms

Standard EN 61201441

- Control Panel use
- Standard application macros with external control connection diagrams
- Parameters of the Standard Application Program
- Fault tracing
- Fieldbus control

Note: a separate Start-up Guide is attached

Crane Drive EN 3BSE 011179

- Commissioning of the Crane Drive Application Program
- Control Panel use
- Crane program description
- Parameters of the Crane Drive Application Program
- Fault tracing

CONTROL SECTION MANUALS (delivered with optional Control Section)

Advant Controller 80 User's Manual EN 64116487

- AC 80 hardware and connections
- AC 80 software
- Programming
- Diagnostics

Advant Controller 80 Reference Manual PC Elements EN 64021737

- Description of PC and DB elements

Advant Controller 80 Reference Manual TC Elements EN 64331868

- Description of TC elements

BRAKING SECTION MANUAL (delivered with optional Braking Section)

ACA 621/622 Braking Sections User's Manual EN 64243811

- Installation, Start-up, Fault tracing, Technical data
- Dimensional drawings

MANUALS FOR OPTIONAL EQUIPMENT (delivered with optional equipment)

Fieldbus Adapters, I/O Extension Modules, Braking Choppers etc.

- Installation
- Programming
- Fault tracing
- Technical data

ACA 6xx Sections
3 to 4300 kW

Safety and Product Information

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Safety Instructions

Overview

This chapter states the safety instructions that must be followed when installing, operating and servicing the ACS 600 MultiDrive frequency converters. If neglected, physical injury and death may follow, or damage may occur to the frequency converter, the motor and driven equipment. The material in this chapter must be studied before attempting any work on, or with, the unit.

All personnel who will install or do maintenance shall be familiar with the safety instructions before opening the door of the ACS 600 MultiDrive frequency converter cabinet.

When installed and used in accordance with instructions, the ACS 600 MultiDrive causes no risk to its associated environment.

ACS 600 MultiDrive is referred to as ACx 600 in this chapter.

The following notation is used throughout the manual:



Dangerous Voltage WARNING! warns of situations in which a high voltage can cause physical injury and/or damage equipment. The text next to this symbol describes ways to avoid the danger.



General WARNING! warns of situations which can cause physical injury and/or damage equipment by means other than electrical. The text next to this symbol describes ways to avoid the danger.



Electrostatic Discharge WARNING! warns of situations in which an electrostatic discharge can damage equipment. The text next to this symbol describes ways to avoid the danger.

CAUTION! Aims to draw special attention to a particular issue.

Note: Gives additional information or points out more information available on the subject.

Operation

The doors of the ACS 600 MultiDrive frequency converter must be kept locked when the frequency converter is in operation.

The operator should be informed of the significance of the diagnostics. In case of an alarm indication, possibly followed by tripping, the operator should be able to decide whether part of the system should be removed from operation or whether the system should be restarted after resetting the alarm. In the event that part of the drive system is taken out of service, the appropriate maintenance personnel should be called to further investigate the problem.

In most cases, the diagnostic displays can be used for preliminary tracing of the fault location and fault resetting can be done without opening the door of the ACS 600 MultiDrive frequency converters.

Installation and Maintenance Safety

These safety instructions are intended for all work on the ACS 600 MultiDrive. Neglecting these instructions can cause physical injury or death.



WARNING! All electrical installation and maintenance work on the ACx 600 should be carried out by qualified electricians.

Any installation work must be done with power off, and power is not to be reconnected unless the installation work is complete. Dangerous residual voltages remain in capacitors when the disconnecting device is opened. Wait 5 minutes after switching off the supply before starting work. Always ensure by measuring that the voltage between terminals UDC+ and UDC- and frame is close to 0 V and that the supply has been switched off before performing any work on the equipment or making main circuit connections.

If the main circuit of the inverter unit is live, the motor terminals are also live even if the motor is not running!

Open switch fuses of all parallel connected inverters before installation or maintenance work in any of them.

Check the cable connections at the shipping split joints before switching on the supply voltage.

If the auxiliary voltage circuit of the ACx 600 is powered from an external power supply, opening the disconnecting device does not remove all voltages. Control voltages of 115/230 VAC may be present on the digital inputs or outputs even though the inverter unit is not powered. Before starting work, check which circuits remain live after opening of the disconnecting device by referring to the circuit diagrams for your particular delivery. Ensure by measuring that the part of the cabinet you are working on is not live.

In ACx 600 frequency converters, control boards of the converter unit may be at the main circuit potential. Dangerous voltages may be present between the control boards and the frame of the converter unit, when the main circuit voltage is on. It is critical that the measuring instruments, such as an oscilloscope, are used with caution and safety as a high priority. The fault tracing instructions give special mention of cases in which measurements may be performed on the control boards, also indicating the measuring method to be used.

Live parts on the inside of doors are protected against direct contact. Special safety attention shall be paid when handling shrouds made of sheet metal.

Do not make any voltage withstand tests on any part of the unit while the unit is connected. Disconnect motor cables before making any measurements on motors or motor cables.



WARNING! Close switch fuses of all parallel connected inverters before starting the frequency converter.

Do not open the drive section switch fuses when the inverter is running.

Do not use Prevention of Unexpected Start for stopping the drive when the inverter is running. Give a Stop command instead.

CAUTION! Fans may continue to rotate for a while after the disconnection of the electrical supply.

CAUTION! Some parts like heatsinks of power semiconductors and toroidal cores on motor cables inside of cabinet remain hot for a while after the disconnection of the electrical supply.

Starting TSU or DSU



Note the warning below before starting drives equipped with a Thyristor or Diode Supply Section.

WARNING! Before power switch-on, make sure that a sufficient inverter power is connected to the intermediate circuit. Rules of thumb:

1. The sum power of the inverters connected must be at least 30% of the sum power of all inverters.
2. The sum power of the inverters connected must be at least 30% of the rated power of the braking section ($P_{br.max}$) if present.

If the above mentioned rules are not followed, the DC fuses of the connected inverter(s) may blow or the braking chopper (if used) may be damaged.

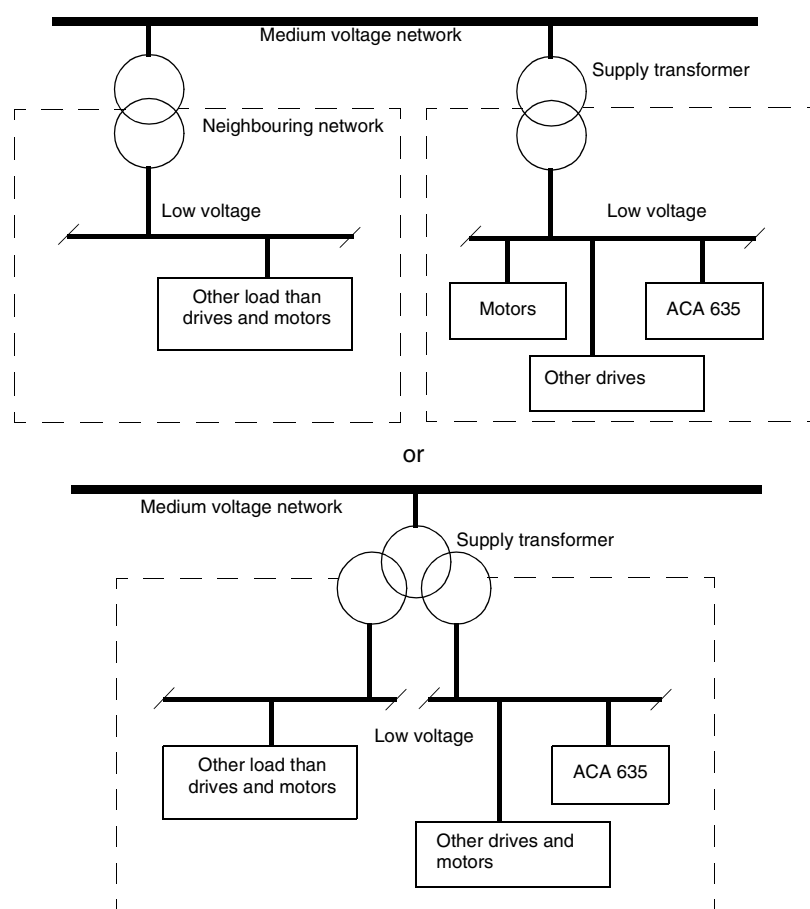
The phenomena which result in a fuse blow are as follows:

- At start, a charging current high enough for charging all the inverters flows to the connected ones.
- In Thyristor Supply Sections, the DC voltage may overshoot the controller bridge change limit, causing an immediate change to regeneration and a high reverse current.
- The DC voltage may overshoot the braking chopper controller voltage limit, causing an immediate switching into braking mode and a high braking current, which in turn discharges low power inverter capacitors.

The braking chopper may be damaged by repeated on-off switching of the braking due to a high supply and braking section power compared to the inverter power.

ACA 635 (ISU) Supply

WARNING! ACA 635 must be supplied with a transformer dedicated to drives and motors or equipment of equal or higher power, or with a transformer equipped with two secondary windings, one of which is dedicated to drives and motors. Resonances might occur if there is capacitive load (e.g. lighting, PC, PLC, small power factor compensation capacitors) in the same network with ACA 635. The resonance current might damage some unit in the network.

**Supply Connections**

The supply section is equipped with a disconnecting device. The electric parts of the whole drive system can be separated by the disconnecting device from the mains network for installation and maintenance work. The supply disconnecting device must be locked to the open position during installation and maintenance work. Both disconnecting devices of 12-pulse units must be locked to the open position during installation and maintenance work.

The supply section can be equipped with an earthing switch as an option. It is used to earth the AC busbars for safety reasons when work is being done on the system. The device is mechanically or electrically interlocked with the main switch.



WARNING! Each drive section can be equipped with an optional manually operated switch fuse for electrical disconnection. During maintenance work in the drive section or on the motor or the motor cable, the switch fuses of all parallel connected drive sections must be locked to the open position, or the DC fuses of all parallel connected drive sections must be removed if the switch fuses are not installed.


Opening the disconnecting device does not remove all control voltages. Before starting work, check with the circuit diagrams which circuits remain live after opening the disconnecting device. **Note:** Voltages from external control circuits may be present.

Earth Fault Protective Function

The ACx 600 is equipped with an internal earth fault protective function to protect the unit against earth faults in the inverter, the motor and the motor cable. This is not a personal safety or a fire protection feature. The internal earth fault protective function is not applicable in the parallel connected inverters. For more information on the earth fault parameter settings, see the appropriate firmware manual.

The supply of the ACx 600 can be equipped with an optional earth fault protective function, refer to *Supply Section Manuals*.

Emergency Stop Devices

Emergency stop devices must be installed at each operator control station and at other operating stations where emergency stop may be required. Pressing the  key on the Control Panel of ACS 600 MultiDrive does not generate an emergency stop of the motor or separate the drive from dangerous potential.

An emergency stop function has been provided (optional) in the ACx 600 to stop and switch off the whole drive. The available modes are: Immediate Removal of Power and Controlled Emergency Stop (with thyristor supply only). The emergency stop function must not be used as the normal mode of stopping the drive.

The emergency stop function complies to the principles of the standards listed below.

Table 1 Standards.

| | |
|-------------------------------|---|
| EN 292-1: 1991 | Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology |
| EN 292-2: 1991 | Safety of machinery - Basic concepts, general principles for design - Part 2: technical principles and specifications |
| EN 418: 1992 | Safety of machinery - Emergency stop equipment, functional aspects - Principles for design |
| EN 954-1: 1996 | Safety of machinery - Safety related parts of control systems - Part 1: General principles for design |
| EN 60204-1: 1992 + Corr. 1993 | Safety of machinery - electrical equipment of machines - Part 1: General principles for design |

Immediate Removal of Power (Category 0)

After pressing the emergency stop push-button the power semiconductors of the inverter are blocked (coast stop) and the main contactor (or air circuit-breaker) is opened immediately. No attention is paid to deceleration of the speed of the motor shaft after the emergency stop is activated.

Controlled Emergency Stop (Category 1)

The installer has to make sure that the overriding control fulfils the requirements of EN 60204-1, category 1.

1. Upon receiving the emergency stop signal, each inverter starts braking (by ramp or torque limits) and acknowledges the signal by closing its output contact. (If the emergency stop signal is not acknowledged by all inverters within two seconds, the supply main contactor is opened.)
2. After a delay set with a time relay in the emergency stop circuitry, the supply main contactor is opened. The time delay should be set slightly longer than the inverter stop ramps to ensure controlled braking of all inverters.

Restart

In order to restart the drive system after an emergency stop, the emergency stop push-button has to be released and a reset given before the main contactor (or air circuit-breaker) can be closed and the drive started.

Prevention of Unexpected Start

For personnel safety, it must be possible for the operator to prevent unexpected start of the drive while the production machine is serviced. **Note:** Prevention of Unexpected Start must not to be used for stopping the drive when the inverter is running. A Stop command must be given instead.

The ACS 600 MultiDrive can be equipped with an optional Prevention of Unexpected Start according to the standards: EN 292-1: 1991, EN 292-2: 1991, EN 954-1: 1996, EN 60204-1-1: 1992 + Corr. 1993 (refer to Table 1) and EN 1037: 1995.

The function is achieved by disconnecting the control voltage to the power semiconductors of the inverter. Thus it is not possible for the power semiconductors to switch and generate the AC voltage needed to rotate the motor. In case of faulty main circuit components, the DC voltage from the busbar can be connected to the motor but an AC motor cannot rotate without the field generated by the AC voltage.

The operator activates the Prevention of Unexpected Start with a switch mounted on the control desk. When Prevention of Unexpected Start is activated, the switch is turned to position "0". A signal lamp will be lit on the control desk, indicating that Prevention of Unexpected Start is activated.



WARNING! Prevention of Unexpected Start does not disconnect the voltage of the main and auxiliary circuits. Therefore maintenance work on electrical parts can only be carried out after disconnecting the drive system.

Motor Connections



WARNING! Operation is not allowed if the motor nominal voltage is less than one half of the ACx 600 nominal input voltage, or the motor nominal current is less than 1/6 of the ACx 600 nominal output current (I_{2base} for 50s/60s duty cycle).

Pulses in the Drive Output

As with all frequency converters employing the most modern IGBT inverter technology, the ACS 600 output comprises – regardless of output frequency – pulses of approximately 1.35 times the mains network voltage with a very short rise time.

The voltage of the pulses can be almost double at the motor terminals, depending on the motor cable properties. This in turn can cause additional stress to the motor insulation.

Modern variable speed drives with their fast rising voltage pulses and high switching frequencies can cause current pulses through the bearings whose repeated discharging can gradually erode the bearing races.

Protecting the Motor Wiring

The stress to motor insulation can be avoided by optional ABB du/dt filters. du/dt filters also reduce bearing currents.

Protecting the Motor Bearing

To avoid damage occurring to motor bearings, insulated N (non-driven end) bearings must be used generally with 100 kW and higher motor powers. In addition, common mode filters from ABB must be used according to the following table. The common mode filter is composed of toroidal cores installed onto the motor cable. The cables must be selected and installed according to the instructions given in the appropriate *Hardware Manual*. The precautions to minimize the risk on motor bearing damage depend on the motor size and rated power. Three types of filters are used alone or in combinations:

1. optional ACS 600 du/dt filter (protects motor insulation system and reduces bearing currents)
2. ACS 600 common mode filter (mainly reduces bearing currents)
3. ACS 600 light common mode filter (mainly reduces bearing currents).

Requirements Table

The following table shows how to select the motor insulation system and when optional ACS 600 du/dt filters, insulated N (non-driven end) motor bearings and ACS 600 common mode filters are required at the output of the drive. The motor manufacturer should be consulted regarding the construction of the motor insulation and additional requirements for explosion-safe motors. Failure of the motor to fulfil the following requirements may shorten its life or damage the motor bearings.

| Manufacturer | Motor Type | Nominal Mains Voltage | Requirement for | | | |
|--|--|---|---|--|---|---------------------------|
| | | | Motor Insulation System | ACS 600 du/dt Filter, ACS 600 Common Mode Filter and Insulated N-bearing | | |
| | | | | $P_N < 100 \text{ kW}$ and Frame Size < IEC 315 | $100 \text{ kW} \leq P_N < 350 \text{ kW}$ or Frame Size \geq IEC 315 | $P_N \geq 350 \text{ kW}$ |
| A B B | Random-wound M2_ and M3_ | $U_N \leq 500 \text{ V}$ | Standard | - | + N | + N + CMF |
| | | $500 \text{ V} < U_N \leq 600 \text{ V}$ | Standard | + du/dt | + du/dt | + du/dt + N + LCMF |
| | | | or | Reinforced | - | + N |
| | $600 \text{ V} < U_N \leq 690 \text{ V}$ | Reinforced | + du/dt | + du/dt | + du/dt + N + LCMF | |
| | Form-wound HXR and AM_ | $380 \text{ V} < U_N \leq 690 \text{ V}$ | Standard | n.a. | + N + CMF | + N + CMF |
| | Old* form-wound HX_ and modular | $380 \text{ V} < U_N \leq 690 \text{ V}$ | Check from the motor manufacturer. | + du/dt filter with voltages over 500 V + N + CMF | | |
| Random-wound HXR | $380 \text{ V} < U_N \leq 690 \text{ V}$ | Check from the motor manufacturer. | + du/dt filter with voltages over 500 V + N + CMF | | | |
| N O N - A B B | Random-wound | $U_N \leq 420 \text{ V}$ | Standard: $\dot{U}_{LL} = 1300 \text{ V}$ | - | + N or CMF | + N + CMF |
| | | $420 \text{ V} < U_N \leq 500 \text{ V}$ | Standard: $\dot{U}_{LL} = 1300 \text{ V}$ | + du/dt | + du/dt + N | + du/dt + N + CMF |
| | | | | or | + du/dt + CMF | |
| | | or | Reinforced: $\dot{U}_{LL} = 1600 \text{ V}$, 0.2 microsecond rise time | - | + N or CMF | + N + CMF |
| | $500 \text{ V} < U_N \leq 600 \text{ V}$ | Reinforced: $\dot{U}_{LL} = 1600 \text{ V}$ | + du/dt | + du/dt | + du/dt + N + LCMF | |
| | | or | Reinforced: $\dot{U}_{LL} = 1800 \text{ V}$ | - | + N or CMF | + N + CMF |
| | | $600 \text{ V} < U_N \leq 690 \text{ V}$ | Reinforced: $\dot{U}_{LL} = 1800 \text{ V}$ | + du/dt | + du/dt | + du/dt + N + LCMF |
| Form-wound | $U_N \leq 690 \text{ V}$ | Reinforced: $\dot{U}_{LL} = 2000 \text{ V}$, 0.3 microsecond rise time | n.a. | + N + CMF | + N + CMF | |

* manufactured before 1992

Note 1: The abbreviations and concepts used in the table are defined below.

| Abbreviation | Concept | Definition |
|--------------|---|--|
| - | U_N | nominal mains voltage |
| - | $\hat{U}_{LL} = \dots V$ | peak line to line voltage at motor terminals which the motor insulation withstands |
| - | Rise time: $\Delta t = 0.8 \cdot \hat{U}_{LL} / (du/dt)$ | The time interval during which the line to line voltage at motor terminals changes from 10 % to 90 % of the whole voltage range. \hat{U}_{LL} and Δt depend on cable length. See the figures below. |
| - | P_N | motor nominal power |
| du/dt | - | du/dt filter |
| CMF | Common mode filter | 3 toroidal cores per each motor cable |
| LCMF | Light common mode filter | 1 toroidal core per each motor cable |
| N | N-bearing | insulated motor non-driven end bearing |
| n.a. | - | Motors of this power range are not available as standard units. Consult the motor manufacturer. |

Note 2: *ACA 635 IGBT Supply Sections and the ACS/ACC 611*

If voltage is raised by the ACA 635 or the ACS/ACC 611, select the motor insulation system according to the increased intermediate circuit d.c. voltage level, especially in the 500 V (+10%) supply voltage range.

Note 3: *HXR and AMA Motors*

All AMA machines (manufactured in Helsinki) to be supplied by a frequency converter have form-wound windings. All HXR machines manufactured in Helsinki since 1997 have form-wound windings.

Note 4: *Chopper Resistor Braking*

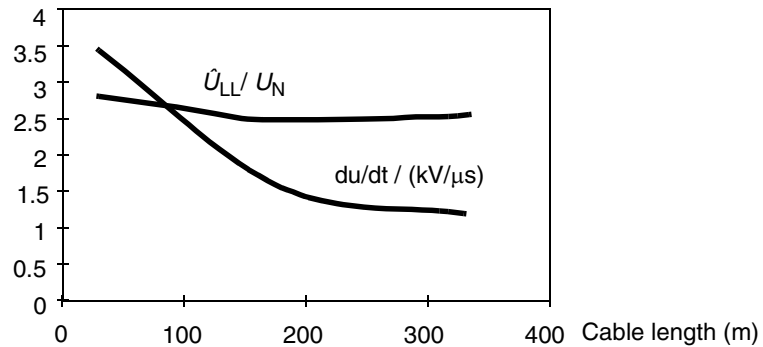
When the drive is in braking mode for a large part of its operation time, the intermediate circuit DC voltage of the drive increases, the effect being similar to increasing the supply voltage by up to 20 percent. This should be taken into consideration when determining the motor insulation requirement.

Example: Motor insulation requirement for a 400 V application must be selected as if the drive was supplied with 480 V.

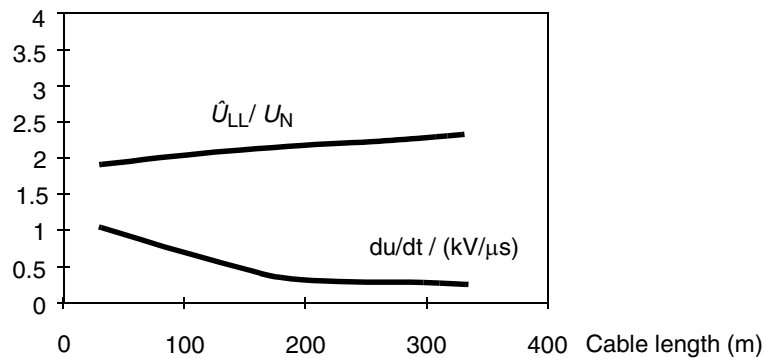
Note 5: This table applies to NEMA motors with the following heading.

| | | |
|---|---|---------------------------|
| $P_N < 134 \text{ HP}$ and Frame Size < NEMA 500 | $134 \text{ HP} \leq P_N < 469 \text{ HP}$ or Frame Size \geq NEMA 500 | $P_N \geq 469 \text{ HP}$ |
|---|---|---------------------------|

Without Filtering Below is a diagram of \hat{U}_{LL} and du/dt as a function of cable length when no du/dt filter is used.



With du/dt Filter Below is a diagram of \hat{U}_{LL} and du/dt as a function of cable length with du/dt filter at the output of the ACx 600.



Power Factor Compensation Capacitors Power factor compensation capacitors and surge absorbers must not be connected to the motor cables. These devices are not designed to be used with frequency converters, and will degrade motor control accuracy. They can cause permanent damage to the ACx 600 or themselves due to the rapid changes in the ACx 600 output voltage.

If there are power factor compensation capacitors in parallel with the ACx 600 make sure that the capacitors and the ACx 600 are not charged simultaneously to avoid voltage surges which might damage the unit.

Components Connected to Digital/Analogue Inputs



WARNING! IEC 664 requires double or reinforced insulation between live parts and the surface of accessible parts of electrical equipment which are either non-conductive or conductive but not connected to the protective earth.

To fulfil this requirement, the connection of a thermistor (and other similar components) to the digital inputs of ACx 600 can be implemented in three alternate ways:

1. There is double or reinforced insulation between the thermistor and live parts of the motor.
 2. Circuits connected to all digital and analogue inputs of the ACx 600
 - are protected against contact, and
 - insulated with basic insulation (the same voltage level as the converter main circuit) from other low voltage circuits.
 3. An external thermistor relay is used. The insulation of the relay must be rated for the same voltage level as the converter main circuit.
-

EMC

Note: If safety switches, contactors, connection boxes or similar equipment are used in the motor cable, they should be installed in a metal enclosure with 360 degrees earthing for the screens of both the incoming cable and the outgoing cable, or the screens of the cables should otherwise be connected together.

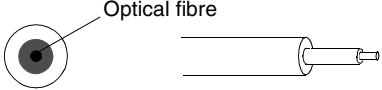
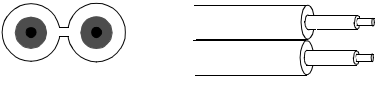

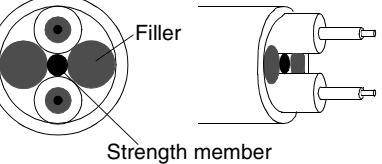


WARNING! The printed circuit boards contain integrated circuits that are extremely sensitive to electrostatic discharge. Exercise appropriate care when working on the unit to avoid permanent damage to the circuits. Do not touch the boards unnecessarily. When handling the printed circuit boards, the use of a properly earthed wrist strap and other appropriate material for the handling of printed circuit boards is recommended.

Fibre Optic Cables



WARNING! Handle the fibre optic cables with care (especially when joining the shipping splits). When unplugging optic cables, always grab the connector, not the cable itself. Do not touch the ends of the fibres with bare hands as the fibre is extremely sensitive to dirt.

| Cable Type | Parameter | Minimum | Maximum | Unit |
|--|-----------------------------------|---------|----------------------------|--------|
| Plastic Optical Cable (POF, fibre core diameter 1 mm): Simplex  Duplex (zipcord)  | Storage and Operating Temperature | -55 | +85 | °C |
| | Recommended Operating Temperature | -40 | +85 | °C |
| | Installation Temperature | -20 | +70 | °C |
| | Short Term Tensile Force | | Simplex: 50 Duplex: 100 | N |
| | Short Term Bend Radius | 25 | | mm |
| | Long Term Bend Radius | 35 | | mm |
| | Long Term Tensile Load | | 1 | N |
| | Flexing | | 1000 | cycles |
| Hard Clad Silica Oval Shape Duplex Cable (HCS[®], SpecTran, fibre core diameter 200 µm, outer dimensions 3.2 x 5.4 mm)  | Storage Temperature | -40 | +80 | °C |
| | Operating Temperature | -20 | +80 | °C |
| | Short Term Tensile Force | | 46/205 | lbs./N |
| | Long Term Tensile Force | | 10/44 | lbs./N |
| | Bend Radius | 25 | | mm |
| Hard Clad Silica 2-channel (Duplex) Cable (HCS[®], SpecTran, fibre core diameter 200 µm, outer diameter 7.5 mm):  | Storage and Operating Temperature | -40 | +85 | °C |
| | Short Term Tensile Force | | 46/205 | lbs./N |
| | Long Term Tensile Force | | 10/44 | lbs./N |
| | Bend Radius | 75 | | mm |

Cooling



WARNING! The cooling air flow and space requirements must be fulfilled. Air flow from below (from a cable conduit) to the cabinet must be prevented to ensure the degree of protection and fire protection.

Mechanical Installation **CAUTION!** Fastening any device to the cabinet frame for lifting purposes is forbidden.

CAUTION! Make sure that dust from drilling does not enter the cabinet when installing. Electrically conductive dust inside the unit may cause damage or lead to malfunction.

CAUTION! Welding of the cabinet frame is not recommended because it may damage electronic circuits located in the drive sections. However, if electric welding is the only way to mount the cabinet connect the return conductor of the welding equipment low to the cabinet frame within 0.5 metres of the welding point to reduce the risk of damage.

ACS 600 MultiDrive – Technical Data

Abbreviations

The abbreviations used in the following supply and drive section rating tables are explained below.

| Supply Section | Drive Section |
|--|--|
| I_{1N} Total rms input current (continuous a.c. current) | I_{2N} Rated rms a.c. output current (= maximum continuous output current) |
| Duty Cycle (10 s / 60 s) I_{DCbase} Maximum base current with I_{DCmax} . I_{DCbase} is 60 % of I_{DC} . I_{DCmax} Short term rms overload d.c. current (allowed for 10 seconds every 60 seconds) | 200 % Duty Cycle (10 s / 60 s) I_{2base} Maximum base current with I_{2max} . I_{2base} is the nominal heavy duty output current. I_{2max} Short term rms a.c. overload current (allowed for 10 seconds every 60 seconds) i.e. maximum output current |
| | |
| Duty Cycle (1 min / 5 min) I_{DCbase} Maximum base current with I_{DCmax} . I_{DCbase} is 60 % of I_{DC} . I_{DCmax} Short term rms overload d.c. current (allowed for one minute every 5 minutes). | 150 % Duty Cycle (1 min / 5 min) I_{2base} Maximum base current with I_{2max} I_{2max} Short term rms a.c. overload current (allowed for one minute every 5 minutes) |
| | |
| I_{DC} Continuous d.c. current S_N Rated apparent output power of the supply section P_N Nominal output power (continuous active power) P_G Regenerative braking power to mains P_{loss} Power loss U_N Nominal mains voltage | S_N Rated apparent output power of the drive section P_N Typical motor power. The power ratings in kW apply to most IEC 34 motors. U_N Nominal mains voltage |

Note 1: Drive section output currents are valid when output frequency is above 10 Hz.

Note 2: The ratings given correspond to voltage U_N and fan supply voltage 230 V or 115 V.

Note 3: The limiting factor for P_G in thyristor supply sections with autotransformer is either the autotransformer or the generator bridge current depending on the configuration of the supply section.

Supply Section Tables The following tables specify the ratings for the supply sections. For IGBT supply section ratings see *ACA 635 IGBT Supply Sections User's Manual* (EN code 64013700).

Notes The notes concerning the supply section tables are listed below.

P_{loss} P_{loss} is the heat loss of a unit with basic options.

Noise Level Noise level applies to echoless room.

Height Cabinet height is 2072 mm for IP 54R classification.

Weight/Width Bottom and top entry weights in the following tables apply to units with basic options and aluminium DC busbars. **Width (EMC)** is the width of the EMC filter cabinet, **Weight (EMC)** is the additional weight due to the EMC filter cabinet.

An auxiliary control unit is included in every ACS 600 MultiDrive delivery. The following tables do not include the width and weight of the auxiliary control unit: 400 mm (approximately 170 kg) or 600 mm (approximately 190 kg).

Ratings 380...415 V The table below shows the nominal ratings for the 400 V range supply sections.

| Type Marking | Nominal Ratings | | | | | Duty Cycle (10 s / 60 s) | | Duty Cycle (1 min / 5 min) | | Frame | Air Flow m ³ /h | P _{loss} kW | Noise Level dBA |
|---|-----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------|-------------------------|-------------------------------|-------------------------|-------|-----------------------------------|-----------------------------|---------------------------|
| | S _N kVA | I _{1N} A | I _{DC} A | P _N kW | P _G kW | I _{DCbase} A | I _{DCmax} A | I _{DCbase} A | I _{DCmax} A | | | | |
| Diode supply sections (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 631-0140-31-xx | 140 | 202 | 247 | 131 | – | 148 | 317 | 148 | 289 | B2 | 370 | 1.5 | 56 |
| ACA 631-0200-31-xx | 200 | 289 | 354 | 188 | – | 212 | 455 | 212 | 414 | B2 | 370 | 2.3 | 56 |
| ACA 631-0300-31-xx | 300 | 433 | 530 | 282 | – | 318 | 795 | 318 | 700 | B3 | 770 | 2.8 | 64 |
| ACA 631-0420-31-xx | 420 | 606 | 742 | 394 | – | 445 | 1113 | 445 | 979 | B3 | 770 | 3.6 | 64 |
| ACA 631-0680-31-xx | 680 | 981 | 1202 | 639 | – | 721 | 1947 | 721 | 1406 | B4 | 1500 | 6.3 | 70 |
| ACA 631-1120-31-xx | 1120 | 1617 | 1980 | 1053 | – | 1188 | 3208 | 1188 | 2317 | B4 | 1500 | 10.2 | 70 |
| ACA 631-1700-31-xx | 1697 | 2449 | 3000 | 1595 | – | 1800 | 4860 | 1800 | 3798 | B5 | 2800 | 16.5 | 74 |
| ACA 631-2100-31-xx | 1980 | 2858 | 3500 | 1861 | – | 2100 | 5670 | 2100 | 4431 | B5 | 2800 | 20.8 | 74 |
| Thyristor supply sections (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 632-0015-31-xx | 12 | 18 | 22 | 12 | 11 | 13 | 28 | 13 | 26 | B1 | 150 | 1.1 | 55 |
| ACA 632-0030-31-xx | 26 | 37 | 45 | 24 | 22 | 27 | 58 | 27 | 53 | B1 | 150 | 1.1 | 55 |
| ACA 632-0040-31-xx | 38 | 55 | 67 | 36 | 32 | 40 | 86 | 40 | 78 | B1 | 150 | 1.1 | 55 |
| ACA 632-0070-31-xx | 71 | 102 | 125 | 66 | 60 | 75 | 161 | 75 | 146 | B1 | 150 | 1.1 | 55 |
| ACA 632-0140-31-xx | 140 | 202 | 247 | 131 | 118 | 148 | 317 | 148 | 289 | B2 | 370 | 1.5 | 56 |
| ACA 632-0200-31-xx | 200 | 289 | 354 | 188 | 169 | 212 | 455 | 212 | 414 | B2 | 370 | 2.3 | 56 |
| ACA 632-0300-31-xx | 300 | 433 | 530 | 282 | 254 | 318 | 795 | 318 | 700 | B3 | 770 | 2.8 | 64 |
| ACA 632-0420-31-xx | 420 | 606 | 742 | 394 | 355 | 445 | 1113 | 445 | 979 | B3 | 770 | 3.6 | 64 |
| ACA 632-0680-31-xx | 680 | 981 | 1202 | 639 | 575 | 721 | 1947 | 721 | 1406 | B4 | 2500 | 6.3 | 72 |
| ACA 632-1120-31-xx | 1120 | 1617 | 1980 | 1053 | 947 | 1188 | 3208 | 1188 | 2317 | B4 | 2500 | 10.2 | 72 |
| ACA 632-1700-31-xx | 1697 | 2449 | 3000 | 1595 | 1435 | 1800 | 4860 | 1800 | 3798 | B5 | 4500 | 16.5 | 75 |
| ACA 632-2100-31-xx | 1980 | 2858 | 3500 | 1861 | 1675 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| Asymmetrical thyristor supply sections (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 632-1700/0680-31-xx | 1697 | 2449 | 3000 | 1595 | 575 | 1800 | 4860 | 1800 | 3798 | B5 | 4500 | 16.5 | 75 |
| ACA 632-1700/1120-31-xx | 1697 | 2449 | 3000 | 1595 | 947 | 1800 | 4860 | 1800 | 3798 | B5 | 4500 | 16.5 | 75 |
| ACA 632-2100/0680-31-xx | 1980 | 2858 | 3500 | 1861 | 575 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| ACA 632-2100/1120-31-xx | 1980 | 2858 | 3500 | 1861 | 947 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| 12 pulse diode supply sections (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 633-0280-31-xx | 280 | 404 | 494 | 263 | – | 296 | 634 | 296 | 578 | B2 | 2x370 | 2x1.5 | 56 |
| ACA 633-0400-31-xx | 400 | 578 | 708 | 376 | – | 425 | 909 | 425 | 828 | B2 | 2x370 | 2x2.3 | 56 |
| ACA 633-0600-31-xx | 600 | 866 | 1060 | 564 | – | 636 | 1590 | 636 | 1399 | B3 | 2x770 | 2x2.8 | 64 |
| ACA 633-0840-31-xx | 840 | 1212 | 1484 | 789 | – | 890 | 2226 | 890 | 1959 | B3 | 2x770 | 2x3.6 | 64 |
| ACA 633-1360-31-xx | 1360 | 1962 | 2404 | 1279 | – | 1442 | 3894 | 1442 | 2813 | B4 | 2x1500 | 2x6.3 | 72 |
| ACA 633-2240-31-xx | 2240 | 3234 | 3960 | 2106 | – | 2376 | 6415 | 2376 | 4633 | B4 | 2x1500 | 2x10.2 | 72 |
| ACA 633-3400-31-xx | 3394 | 4898 | 6000 | 3190 | – | 3600 | 9720 | 3600 | 7596 | B5 | 2x2800 | 2x16.5 | 75 |
| 6 pulse thyristor supply sections with autotransformer (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 634-0200-31-xx | 200 | 289 | 354 | 188 | 171 | 212 | 455 | 212 | 414 | B2 | 370 | 2.3 | 56 |
| ACA 634-0420-31-xx | 420 | 606 | 742 | 394 | 388 | 445 | 1113 | 445 | 979 | B3 | 770 | 3.6 | 64 |
| ACA 634-0680-31-xx | 680 | 981 | 1202 | 639 | 639 | 721 | 1947 | 721 | 1406 | B4 | 2500 | 6.3 | 72 |
| ACA 634-1120-31-xx | 1120 | 1617 | 1980 | 1053 | 639 | 1188 | 3208 | 1188 | 2317 | B4 | 2500 | 10.2 | 72 |
| ACA 634-1700-31-xx | 1697 | 2449 | 3000 | 1595 | 1065 | 1800 | 4860 | 1800 | 3798 | B5 | 4500 | 16.5 | 75 |
| ACA 634-2100-31-xx | 1980 | 2858 | 3500 | 1861 | 1065 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| 12 pulse thyristor supply sections (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 636-0800-31-xx | 798 | 1151 | 1410 | 761 | 685 | 846 | 2115 | 846 | 1861 | B3 | 2x770 | 2x3.6 | 66 |
| ACA 636-1290-31-xx | 1292 | 1865 | 2284 | 1232 | 1109 | 1370 | 3700 | 1370 | 2672 | B4 | 2x2500 | 2x6.3 | 74 |
| ACA 636-2130-31-xx | 2128 | 3072 | 3763 | 2030 | 1827 | 2257 | 6094 | 2257 | 4402 | B4 | 2x2500 | 2x10.2 | 74 |
| ACA 636-3220-31-xx | 3224 | 4654 | 5701 | 3076 | 2768 | 3420 | 9234 | 3420 | 7216 | B5 | 2x4500 | 2x16.5 | 77 |
| 12 pulse thyristor supply sections with autotransformer (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 638-0800-31-xx | 798 | 1151 | 1410 | 761 | 761 | 846 | 2115 | 846 | 1861 | B3 | 2x770 | 2x3.6 | 66 |
| ACA 638-1290-31-xx | 1292 | 1865 | 2284 | 1232 | 776 | 1370 | 3700 | 1370 | 2672 | B4 | 2x2500 | 2x6.3 | 74 |
| ACA 638-2130-31-xx | 2128 | 3072 | 3763 | 2030 | 1277 | 2257 | 6094 | 2257 | 4402 | B4 | 2x2500 | 2x10.2 | 74 |
| ACA 638-3220-31-xx | 3224 | 4654 | 5701 | 3076 | 2130 | 3420 | 9234 | 3420 | 7216 | B5 | 2x4500 | 2x16.5 | 77 |
| 12/6 pulse thyristor supply sections with autotransformer (380...415 V Range, U_N = 400 V) | | | | | | | | | | | | | |
| ACA 639-0800-31-xx | 798 | 1151 | 1410 | 761 | 380 | 846 | 2115 | 846 | 1861 | B3 | 2x770 | 2x3.6 | 66 |
| ACA 639-1290-31-xx | 1292 | 1865 | 2284 | 1232 | 388 | 1370 | 3700 | 1370 | 2672 | B4 | 4000 | 2x6.3 | 74 |
| ACA 639-2130-31-xx | 2128 | 3072 | 3763 | 2030 | 639 | 2257 | 6094 | 2257 | 4402 | B4 | 4000 | 2x10.2 | 74 |
| ACA 639-3220-31-xx | 3224 | 4654 | 5701 | 3076 | 1065 | 3420 | 9234 | 3420 | 7216 | B5 | 7300 | 2x16.5 | 77 |

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Ratings 525...690 V The table below shows the nominal ratings for the 690 V range supply sections.

| Type Marking | Nominal Ratings | | | | | Duty Cycle (10 s / 60 s) | | Duty Cycle (1 min / 5 min) | | Frame | Air Flow m ³ /h | P _{loss} kW | Noise Level dBA |
|---|-----------------|----------------|-----------------|----------------|----------------|--------------------------|--------------------|----------------------------|--------------------|-------|-------------------------------|-------------------------|--------------------|
| | S _N | I _N | I _{DC} | P _N | P _G | I _{DCbase} | I _{DCmax} | I _{DCbase} | I _{DCmax} | | | | |
| | kVA | A | A | kW | kW | A | A | A | A | | | | |
| Diode supply sections (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 631-0090-61-xx | 90 | 75 | 92 | 83 | – | 55 | 118 | 55 | 108 | B2 | 370 | 0.6 | 56 |
| ACA 631-0175-61-xx | 175 | 146 | 179 | 161 | – | 107 | 230 | 107 | 209 | B2 | 370 | 1.5 | 56 |
| ACA 631-0250-61-xx | 250 | 209 | 256 | 231 | – | 154 | 329 | 154 | 300 | B2 | 370 | 2.3 | 56 |
| ACA 631-0375-61-xx | 375 | 314 | 384 | 346 | – | 230 | 576 | 230 | 507 | B3 | 770 | 2.8 | 64 |
| ACA 631-0525-61-xx | 525 | 439 | 538 | 484 | – | 323 | 807 | 323 | 710 | B3 | 770 | 3.6 | 64 |
| ACA 631-0850-61-xx | 850 | 711 | 871 | 784 | – | 523 | 1411 | 523 | 1019 | B4 | 1500 | 6.3 | 70 |
| ACA 631-1400-61-xx | 1400 | 1171 | 1435 | 1292 | – | 861 | 2325 | 861 | 1679 | B4 | 1500 | 10.2 | 70 |
| ACA 631-2600-61-xx | 2600 | 2176 | 2664 | 2400 | – | 1598 | 4316 | 1598 | 3373 | B5 | 2800 | 16.5 | 74 |
| ACA 631-3600-61-xx | 3415 | 2858 | 3500 | 3152 | – | 2100 | 5670 | 2100 | 4431 | B5 | 2800 | 20.8 | 74 |
| Thyristor supply sections (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 632-0090-61-xx | 90 | 75 | 92 | 83 | 74 | 55 | 118 | 55 | 108 | B2 | 370 | 0.6 | 56 |
| ACA 632-0175-61-xx | 175 | 146 | 179 | 161 | 145 | 107 | 230 | 107 | 209 | B2 | 370 | 1.5 | 56 |
| ACA 632-0250-61-xx | 250 | 209 | 256 | 231 | 207 | 154 | 329 | 154 | 300 | B2 | 370 | 2.3 | 56 |
| ACA 632-0375-61-xx | 375 | 314 | 384 | 346 | 312 | 230 | 576 | 230 | 507 | B3 | 770 | 2.8 | 64 |
| ACA 632-0525-61-xx | 525 | 439 | 538 | 484 | 436 | 323 | 807 | 323 | 710 | B3 | 770 | 3.6 | 64 |
| ACA 632-0850-61-xx | 850 | 711 | 871 | 784 | 706 | 523 | 1411 | 523 | 1019 | B4 | 2500 | 6.3 | 72 |
| ACA 632-1400-61-xx | 1400 | 1171 | 1435 | 1292 | 1163 | 861 | 2325 | 861 | 1679 | B4 | 2500 | 10.2 | 72 |
| ACA 632-2600-61-xx | 2600 | 2176 | 2664 | 2399 | 2159 | 1598 | 4316 | 1598 | 3373 | B5 | 4500 | 16.5 | 75 |
| ACA 632-3600-61-xx | 3415 | 2858 | 3500 | 3152 | 2837 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| Asymmetrical thyristor supply sections (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 632-2600/0850-61-xx | 2600 | 2176 | 2664 | 2399 | 706 | 1598 | 4316 | 1598 | 3373 | B5 | 4500 | 16.5 | 75 |
| ACA 632-2600/1400-61-xx | 2600 | 2176 | 2664 | 2399 | 1163 | 1598 | 4316 | 1598 | 3373 | B5 | 4500 | 16.5 | 75 |
| ACA 632-3600/0850-61-xx | 3415 | 2858 | 3500 | 3152 | 706 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| ACA 632-3600/1400-61-xx | 3415 | 2858 | 3500 | 3152 | 1163 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| ACA 632-3600/2600-61-xx | 3415 | 2858 | 3500 | 3152 | 2159 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| 12 pulse diode supply sections (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 633-0180-61-xx | 180 | 150 | 184 | 165 | – | 110 | 236 | 110 | 215 | B2 | 2x370 | 2x0.6 | 56 |
| ACA 633-0350-61-xx | 350 | 292 | 358 | 322 | – | 215 | 460 | 215 | 419 | B2 | 2x370 | 2x1.5 | 56 |
| ACA 633-0500-61-xx | 500 | 418 | 512 | 461 | – | 307 | 657 | 307 | 599 | B2 | 2x370 | 2x2.3 | 56 |
| ACA 633-0750-61-xx | 750 | 628 | 768 | 693 | – | 461 | 1152 | 461 | 1014 | B3 | 2x770 | 2x2.8 | 64 |
| ACA 633-1050-61-xx | 1050 | 878 | 1076 | 968 | – | 646 | 1614 | 646 | 1420 | B3 | 2x770 | 2x3.6 | 64 |
| ACA 633-1700-61-xx | 1700 | 1422 | 1742 | 1569 | – | 1045 | 2822 | 1045 | 2038 | B4 | 2x1500 | 2x6.3 | 72 |
| ACA 633-2800-61-xx | 2800 | 2342 | 2870 | 2583 | – | 1722 | 4649 | 1722 | 3358 | B4 | 2x1500 | 2x10.2 | 72 |
| ACA 633-5200-61-xx | 5200 | 4352 | 5328 | 4798 | – | 3197 | 8631 | 3197 | 6745 | B5 | 2x2800 | 2x16.5 | 75 |
| 6 pulse thyristor supply sections with autotransformer (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 634-1400-61-xx | 1400 | 1171 | 1435 | 1292 | 1063 | 861 | 2325 | 861 | 1679 | B4 | 2500 | 10.2 | 72 |
| ACA 634-2600-61-xx | 2600 | 2176 | 2664 | 2399 | 1874 | 1598 | 4316 | 1598 | 3373 | B5 | 4500 | 16.5 | 75 |
| ACA 634-3600-61-xx | 3415 | 2858 | 3500 | 3152 | 1874 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| 12 pulse thyristor supply sections (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 636-1000-61-xx | 997 | 834 | 1022 | 920 | 828 | 613 | 1533 | 613 | 1349 | B3 | 2x770 | 2x3.6 | 66 |
| ACA 636-1615-61-xx | 1614 | 1351 | 1655 | 1490 | 1341 | 993 | 2681 | 993 | 1936 | B4 | 2x2500 | 2x6.3 | 74 |
| ACA 636-2660-61-xx | 2659 | 2225 | 2726 | 2455 | 2209 | 1636 | 4417 | 1636 | 3190 | B4 | 2x2500 | 2x10.2 | 74 |
| ACA 636-4950-61-xx | 4941 | 4134 | 5065 | 4561 | 4105 | 3037 | 8200 | 3037 | 6408 | B5 | 2x4500 | 2x16.5 | 77 |
| ACA 636-6500-61-xx | 6490 | 5430 | 6652 | 5991 | 5392 | 3990 | 10773 | 3990 | 8419 | B5 | 2x4500 | 2x20.8 | 77 |
| 12 pulse thyristor supply sections with autotransformer (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 638-1615-61-xx | 1614 | 1351 | 1655 | 1490 | 1344 | 993 | 2681 | 993 | 1936 | B4 | 2x2500 | 2x6.3 | 74 |
| ACA 638-2660-61-xx | 2659 | 2225 | 2726 | 2455 | 2214 | 1636 | 4417 | 1636 | 3190 | B4 | 2x2500 | 2x10.2 | 74 |
| ACA 638-4950-61-xx | 4941 | 4134 | 5065 | 4561 | 3905 | 3037 | 8200 | 3037 | 6408 | B5 | 2x4500 | 2x16.5 | 77 |
| ACA 638-6500-61-xx | 6490 | 5430 | 6652 | 5991 | 3905 | 3990 | 10773 | 3990 | 8419 | B5 | 2x4500 | 2x20.8 | 77 |
| 12/6 pulse thyristor supply sections with autotransformer (525...690 V Range, U_N = 690 V) | | | | | | | | | | | | | |
| ACA 639-1615-61-xx | 1614 | 1351 | 1655 | 1490 | 672 | 993 | 2681 | 993 | 1936 | B4 | 4000 | 2x6.3 | 74 |
| ACA 639-2660-61-xx | 2659 | 2225 | 2726 | 2455 | 1107 | 1636 | 4417 | 1636 | 3190 | B4 | 4000 | 2x10.2 | 74 |
| ACA 639-4950-61-xx | 4941 | 4134 | 5065 | 4561 | 1952 | 3037 | 8200 | 3037 | 6408 | B5 | 7300 | 2x16.5 | 77 |
| ACA 639-6500-61-xx | 6490 | 5430 | 6652 | 5991 | 1952 | 3990 | 10773 | 3990 | 8419 | B5 | 7300 | 2x20.8 | 77 |

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Ratings 830 V The table below shows the nominal ratings for the 830 V supply sections.

| Type Marking | Nominal Ratings | | | | | Duty Cycle (10 s / 60 s) | | Duty Cycle (1 min / 5 min) | | Frame | Air Flow m ³ /h | P _{loss} kW | Noise Level dBA |
|--|-----------------------|---------------------|----------------------|----------------------|----------------------|-----------------------------|-------------------------|-------------------------------|-------------------------|-------|-------------------------------|-------------------------|--------------------|
| | S _N kVA | I _N A | I _{DC} A | P _N kW | P _G kW | I _{DCbase} A | I _{DCmax} A | I _{DCbase} A | I _{DCmax} A | | | | |
| Thyristor supply sections (525...830 V Range, U_N = 830 V) | | | | | | | | | | | | | |
| ACA 632-1680-81-xx | 1680 | 1169 | 1432 | 1290 | 1290 | 859 | 2320 | 859 | 1675 | B4 | 2500 | 6.3 | 72 |
| ACA 632-3100-81-xx | 3100 | 2156 | 2640 | 2378 | 2378 | 1584 | 4277 | 1584 | 3342 | B5 | 2500 | 10.2 | 72 |
| ACA 632-3520-81-xx | 3520 | 2449 | 3000 | 2702 | 2702 | 1800 | 4860 | 1800 | 3798 | B5 | 4500 | 16.5 | 75 |
| ACA 632-4310-81-xx | 4110 | 2858 | 3500 | 3152 | 3152 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| Asymmetrical thyristor supply sections (525...830 V Range, U_N = 830 V) | | | | | | | | | | | | | |
| ACA 632-3100/1680-81-xx | 3100 | 2156 | 2640 | 2378 | 1290 | 1584 | 4277 | 1584 | 3342 | B5 | 2500 | 10.2 | 72 |
| ACA 632-3520/1680-81-xx | 3520 | 2449 | 3000 | 2702 | 1290 | 1800 | 4860 | 1800 | 3798 | B5 | 4500 | 16.5 | 75 |
| ACA 632-4310/1680-81-xx | 4110 | 2858 | 3500 | 3152 | 1290 | 2100 | 5670 | 2100 | 4431 | B5 | 4500 | 20.8 | 75 |
| 12 pulse thyristor supply sections (525...830 V Range, U_N = 830 V) | | | | | | | | | | | | | |
| ACA 636-3190-81-xx | 3193 | 2221 | 2721 | 2451 | 2451 | 1632 | 4408 | 1632 | 3183 | B4 | 2x2500 | 2x6.3 | 74 |
| ACA 636-5890-81-xx | 5889 | 4096 | 5018 | 4520 | 4520 | 3010 | 8126 | 3010 | 6350 | B5 | 2x2500 | 2x10.2 | 77 |
| ACA 636-8190-81-xx | 7806 | 5430 | 6652 | 5991 | 5991 | 3990 | 10773 | 3990 | 8419 | B5 | 2x4500 | 2x20.8 | 77 |
| 12/6 pulse thyristor supply sections (525...830 V Range, U_N = 830 V) | | | | | | | | | | | | | |
| ACA 637-3190-81-xx | 3193 | 2221 | 2721 | 2451 | 1225 | 1632 | 4408 | 1632 | 3183 | B4 | 2500 | 2x6.3 | 74 |
| ACA 637-5890-81-xx | 5889 | 4096 | 5018 | 4520 | 2260 | 3010 | 8126 | 3010 | 6350 | B5 | 2500 | 2x10.2 | 77 |
| ACA 637-8190-81-xx | 7806 | 5430 | 6652 | 5991 | 2996 | 3990 | 10773 | 3990 | 8419 | B5 | 4500 | 2x20.8 | 77 |

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Autotransformer Data

The table below shows the nominal ratings for thyristor supply autotransformers.

| Type Marking | Autotransformer | | | | | Forward Bridge Type | Reverse Bridge Type |
|--|-----------------|--------------|------------------|------------|------------|---------------------|---------------------|
| | Type | S_N kVA | S_{rms} kVA | I_1 A | U_1 V | | |
| 400 V Range | | | | | | | |
| 6 pulse thyristor supply sections with autotransformer (380...415 V Range, $U_N = 400$ V) | | | | | | | |
| ACA 634-0200-31-xx | NDAT-08 | 299 | 214 | 416 | 415 | ACN654 0250 5 | ACN664 0250 5 |
| ACA 634-0420-31-xx | NDAT-09 | 677 | 485 | 942 | 415 | ACN654 0525 5 | ACN664 0525 5 |
| ACA 634-0680-31-xx | NDAT-10 | 1115 | 798 | 1552 | 415 | ACN654 0850 5 | ACN664 0850 5 |
| ACA 634-1120-31-xx | NDAT-10 | 1115 | 798 | 1552 | 415 | ACN654 1400 5 | ACN664 1400 5 |
| ACA 634-1700-31-xx | NDAT-11 | 1859 | 1331 | 2587 | 415 | ACN654 2120 5 | ACN664 2120 5 |
| ACA 634-2100-31-xx | NDAT-11 | 1859 | 1331 | 2587 | 415 | ACN654 2600 5 | ACN664 2600 5 |
| 12 pulse thyristor supply sections with autotransformer (380...415 V Range, $U_N = 400$ V) | | | | | | | |
| ACA 638-0800-31-xx | NDAT-09 | 677 | 485 | 942 | 415 | ACN654 0525 5 | ACN664 0525 5 |
| ACA 638-1290-31-xx | NDAT-09 | 677 | 485 | 942 | 415 | ACN654 0855 5 | ACN664 0855 5 |
| ACA 638-2130-31-xx | NDAT-10 | 1115 | 798 | 1552 | 415 | ACN654 1405 5 | ACN664 1405 5 |
| ACA 638-3220-31-xx | NDAT-11 | 1859 | 1331 | 2587 | 415 | ACN654 2120 5 | ACN664 2120 5 |
| 12/6 pulse thyristor supply sections with autotransformer (380...415 V Range, $U_N = 400$ V) | | | | | | | |
| ACA 639-0800-31-xx | NDAT-09 | 677 | 485 | 942 | 415 | ACN654 0525 5 | ACN664 0525 5 |
| ACA 639-1290-31-xx | NDAT-09 | 677 | 485 | 942 | 415 | ACN654 0855 5 | ACN664 0855 5 |
| ACA 639-2130-31-xx | NDAT-10 | 1115 | 798 | 1552 | 415 | ACN654 1405 5 | ACN664 1405 5 |
| ACA 639-3220-31-xx | NDAT-11 | 1859 | 1331 | 2587 | 415 | ACN654 2120 5 | ACN664 2120 5 |
| 500 V Range | | | | | | | |
| 6 pulse thyristor supply sections with autotransformer (380...500 V Range, $U_N = 500$ V) | | | | | | | |
| ACA 634-0250-51-xx | NDAT-02 | 331 | 237 | 277 | 690 | ACN654 0250 5 | ACN664 0375 6 |
| ACA 634-0375-51-xx | NDAT-03 | 696 | 498 | 582 | 690 | ACN654 0375 5 | ACN664 0525 6 |
| ACA 634-0850-51-xx | NDAT-04 | 1126 | 806 | 942 | 690 | ACN654 0850 5 | ACN664 1400 6 |
| ACA 634-1400-51-xx | NDAT-05 | 1855 | 1328 | 1552 | 690 | ACN654 1400 5 | ACN664 2600 6 |
| ACA 634-2120-51-xx | NDAT-05 | 1855 | 1328 | 1552 | 690 | ACN654 2120 5 | ACN664 2600 5 |
| ACA 634-2600-51-xx | NDAT-06 | 3272 | 2343 | 2282 | 690 | ACN654 2600 5 | ACN664 3600 5 |
| 12 pulse thyristor supply sections with autotransformer (380...500 V Range, $U_N = 500$ V) | | | | | | | |
| ACA 638-1000-51-xx | NDAT-03 | 696 | 498 | 582 | 690 | ACN654 0525 5 | ACN664 0525 6 |
| ACA 638-1615-51-xx | NDAT-04 | 1126 | 806 | 942 | 690 | ACN654 0855 5 | ACN664 0855 6 |
| ACA 638-2660-51-xx | NDAT-05 | 1855 | 1328 | 1552 | 690 | ACN654 1405 5 | ACN664 1405 6 |
| ACA 638-4030-51-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 2120 5 | ACN664 2600 6 |
| ACA 638-4700-51-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 2600 5 | ACN664 2600 6 |
| 12/6 pulse thyristor supply sections with autotransformer (380...500 V Range, $U_N = 500$ V) | | | | | | | |
| ACA 639-1000-51-xx | NDAT-03 | 696 | 498 | 582 | 690 | ACN654 0525 5 | ACN664 0525 6 |
| ACA 639-1615-51-xx | NDAT-04 | 1126 | 806 | 942 | 690 | ACN654 0855 5 | ACN664 0855 6 |
| ACA 639-2660-51-xx | NDAT-05 | 1855 | 1328 | 1552 | 690 | ACN654 1405 5 | ACN664 1405 6 |
| ACA 639-4030-51-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 2120 5 | ACN664 2600 6 |
| ACA 639-4700-51-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 2600 5 | ACN664 2600 6 |
| 690 V Range | | | | | | | |
| 6 pulse thyristor supply sections with autotransformer (525...690 V Range, $U_N = 690$ V) | | | | | | | |
| ACA 634-1400-61-xx | NDAT-05 | 1855 | 1328 | 1552 | 690 | ACN654 1400 6 | ACN664 1680 8 |
| ACA 634-2600-61-xx | NDAT-06 | 3272 | 2343 | 2282 | 690 | ACN654 2600 6 | ACN664 3100 8 |
| ACA 634-3600-61-xx | NDAT-06 | 3272 | 2343 | 2282 | 690 | ACN654 3600 6 | ACN664 4210 8 |
| 12 pulse thyristor supply sections with autotransformer (525...690 V Range, $U_N = 690$ V) | | | | | | | |
| ACA 638-1615-61-xx | NDAT-04 | 1126 | 806 | 942 | 690 | ACN654 0855 6 | ACN664 1680 8 |
| ACA 638-2660-61-xx | NDAT-05 | 1855 | 1328 | 1552 | 690 | ACN654 1405 6 | ACN664 1680 8 |
| ACA 638-4950-61-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 2600 6 | ACN664 3100 8 |
| ACA 638-6500-61-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 3600 6 | ACN664 3100 8 |
| 12/6 pulse thyristor supply sections with autotransformer (525...690 V Range, $U_N = 690$ V) | | | | | | | |
| ACA 639-1615-61-xx | NDAT-04 | 1126 | 806 | 942 | 690 | ACN654 0855 6 | ACN664 1680 8 |
| ACA 639-2660-61-xx | NDAT-05 | 1855 | 1328 | 1552 | 690 | ACN654 1405 6 | ACN664 1680 8 |
| ACA 639-4950-61-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 2600 6 | ACN664 3100 8 |
| ACA 639-6500-61-xx | NDAT-06 | 3272 | 2343 | 2738 | 690 | ACN654 3600 6 | ACN664 3100 8 |

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Dimensions and Weights 400 V The table below shows the dimensions and weights of the 400 V range supply sections. See notes on page A-2.

| Type Marking | Height mm | Bottom Entry: Width mm | Top Entry: Width mm | Depth mm | Bottom Entry: Weight kg | Top Entry: Weight kg | Width (EMC) mm | Weight (EMC) kg |
|--|--------------|------------------------------|-----------------------------|-------------|----------------------------------|-------------------------------|----------------------|-----------------------|
| Diode supply sections (380...415 V Range) | | | | | | | | |
| ACA 631-0140-31-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | 400 | 100 |
| ACA 631-0200-31-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | 400 | 100 |
| ACA 631-0300-31-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | 400 | 120 |
| ACA 631-0420-31-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | 600 | 120 |
| ACA 631-0680-31-xx | 2065 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1300 | 1300 | 600 | 150 |
| ACA 631-1120-31-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1300 | 1300 | – | – |
| ACA 631-1700-31-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1600 | 1600 | – | – |
| ACA 631-2100-31-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1600 | 1600 | – | – |
| Thyristor supply sections (380...415 V Range) | | | | | | | | |
| ACA 632-0015-31-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0030-31-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0040-31-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0070-31-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0140-31-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | – | – |
| ACA 632-0200-31-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | – | – |
| ACA 632-0300-31-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | – | – |
| ACA 632-0420-31-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | – | – |
| ACA 632-0680-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | – | – |
| ACA 632-1120-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | – | – |
| ACA 632-1700-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-2100-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| Asymmetrical thyristor supply sections (380...415 V Range, $U_N = 400$ V) | | | | | | | | |
| ACA 632-1700/0680-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-1700/1120-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-2100/0680-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-2100/1120-31-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| 12 pulse diode supply sections (380...415 V Range) | | | | | | | | |
| ACA 633-0280-31-xx | 2065 | 800 (2x400) | 1600 (2x(400+400)) | 600 | 480 | 720 | – | – |
| ACA 633-0400-31-xx | 2065 | 800 (2x400) | 1600 (2x(400+400)) | 600 | 480 | 720 | – | – |
| ACA 633-0600-31-xx | 2065 | 1200 (2x600) | 2400 (2x(600+600)) | 600 | 640 | 900 | – | – |
| ACA 633-0840-31-xx | 2065 | 1200 (2x600) | 2400 (2x(600+600)) | 600 | 640 | 900 | – | – |
| ACA 633-1360-31-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 2400 | 2400 | – | – |
| ACA 633-2240-31-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 2400 | 2400 | – | – |
| ACA 633-3400-31-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 3000 | 3000 | – | – |
| 6 pulse thyristor supply sections with autotransformer (380...415 V Range, $U_N = 400$ V) | | | | | | | | |
| ACA 634-0200-31-xx | 2065 | 1400 (400+600+400) | 1800 (400+400+600+400) | 600 | 950 | 1050 | – | – |
| ACA 634-0420-31-xx | 2065 | 2000 (600+800+600) | 2600 (600+600+800+600) | 600 | 1250 | 1400 | – | – |
| ACA 634-0680-31-xx | 2130 | 3000 (600+400+600+800+600) | 3000 (600+400+600+800+600) | 600 | 2000 | 2000 | – | – |
| ACA 634-1120-31-xx | 2130 | 3000 (600+400+600+800+600) | 3000 (600+400+600+800+600) | 600 | 2000 | 2000 | – | – |
| ACA 634-1700-31-xx | 2130 | 3200 (600+400+600+1000+600) | 3200 (600+400+600+1000+600) | 600 | 2700 | 2700 | – | – |
| ACA 634-2100-31-xx | 2130 | 3200 (600+400+600+1000+600) | 3200 (600+400+600+1000+600) | 600 | 2700 | 2700 | – | – |
| 12 pulse thyristor supply sections (380...415 V Range, $U_N = 400$ V) | | | | | | | | |
| ACA 636-0800-31-xx | 2065 | 2x600 | 2x1200 (2x(600+600)) | 600 | 760 | 1020 | – | – |
| ACA 636-1290-31-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| ACA 636-2130-31-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| ACA 636-3220-31-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| 12 pulse thyristor supply sections with autotransformer (380...415 V Range, $U_N = 400$ V) | | | | | | | | |
| ACA 638-0800-31-xx | 2065 | 4200 | 5400 | 600 | 2560 | 2880 | – | – |
| ACA 638-1290-31-xx | 2130 | 6200 | 6200 | 600 | 4100 | 4100 | – | – |
| ACA 638-2130-31-xx | 2130 | 6200 | 6200 | 600 | 4100 | 4100 | – | – |
| ACA 638-3220-31-xx | 2130 | 6600 | 6600 | 600 | 5500 | 5500 | – | – |
| 12/6 pulse thyristor supply sections with autotransformer (380...415 V Range, $U_N = 400$ V) | | | | | | | | |
| ACA 639-0800-31-xx | 2065 | 2600 (600+800+600+600) | 3800 | 600 | 1640 | 1900 | – | – |
| ACA 639-1290-31-xx | 2130 | 4800 | 4800 | 600 | 3400 | 3400 | – | – |
| ACA 639-2130-31-xx | 2130 | 4800 | 4800 | 600 | 3400 | 3400 | – | – |
| ACA 639-3220-31-xx | 2130 | 5000 | 5000 | 600 | 4100 | 4100 | – | – |

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Dimensions and Weights 500 V The table below shows the dimensions and weights of the 500 V range supply sections. See notes on page A-2.

| Type Marking | Height mm | Bottom Entry: Width mm | Top Entry: Width mm | Depth mm | Bottom Entry: Weight kg | Top Entry: Weight kg | Width (EMC) mm | Weight (EMC) kg |
|--|--------------|------------------------------|-----------------------------|-------------|----------------------------------|-------------------------------|----------------------|-----------------------|
| Diode supply sections (440...500 V Range) | | | | | | | | |
| ACA 631-0175-51-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | 400 | 100 |
| ACA 631-0250-51-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | 400 | 100 |
| ACA 631-0375-51-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | 600 | 120 |
| ACA 631-0525-51-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | 600 | 120 |
| ACA 631-0850-51-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1300 | 1300 | 600 | 150 |
| ACA 631-1400-51-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1300 | 1300 | – | – |
| ACA 631-2120-51-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1600 | 1600 | – | – |
| ACA 631-2600-51-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1600 | 1600 | – | – |
| Thyristor supply sections (440...500 V Range) | | | | | | | | |
| ACA 632-0020-51-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0035-51-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0050-51-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0090-51-xx | 2065 | 400 | 400 | 600 | 250 | 250 | – | – |
| ACA 632-0175-51-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | – | – |
| ACA 632-0250-51-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | – | – |
| ACA 632-0375-51-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | – | – |
| ACA 632-0525-51-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | – | – |
| ACA 632-0850-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | – | – |
| ACA 632-1400-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | – | – |
| ACA 632-2120-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-2600-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| Asymmetrical thyristor supply sections (380...500 V Range, $U_N = 500$ V) | | | | | | | | |
| ACA 632-2120/0850-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-2120/1400-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-2600/0850-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-2600/1400-51-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| 12 pulse diode supply sections (440...500 V Range) | | | | | | | | |
| ACA 633-0350-51-xx | 2065 | 800 (2x400) | 1600 (2x(400+400)) | 600 | 480 | 720 | – | – |
| ACA 633-0500-51-xx | 2065 | 800 (2x400) | 1600 (2x(400+400)) | 600 | 480 | 720 | – | – |
| ACA 633-0750-51-xx | 2065 | 1200 (2x600) | 2400 (2x(600+600)) | 600 | 640 | 900 | – | – |
| ACA 633-1050-51-xx | 2065 | 1200 (2x600) | 2400 (2x(600+600)) | 600 | 640 | 900 | – | – |
| ACA 633-1700-51-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 2400 | 2400 | – | – |
| ACA 633-2800-51-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 2400 | 2400 | – | – |
| ACA 633-4240-51-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 3000 | 3000 | – | – |
| 6 pulse thyristor supply sections with autotransformer (380...500 V Range, $U_N = 500$ V) | | | | | | | | |
| ACA 634-0250-51-xx | 2065 | 1400 (400+600+400) | 1800 (400+400+600+400) | 600 | 950 | 1050 | – | – |
| ACA 634-0375-51-xx | 2065 | 2000 (600+800+600) | 2600 (600+600+800+600) | 600 | 1250 | 1400 | – | – |
| ACA 634-0850-51-xx | 2130 | 3000 (600+400+600+800+600) | 3000 (600+400+600+800+600) | 600 | 2000 | 2000 | – | – |
| ACA 634-1400-51-xx | 2130 | 3200 (600+400+600+1000+600) | 3200 (600+400+600+1000+600) | 600 | 2700 | 2700 | – | – |
| ACA 634-2120-51-xx | 2130 | 3200 (600+400+600+1000+600) | 3200 (600+400+600+1000+600) | 600 | 2700 | 2700 | – | – |
| ACA 634-2600-51-xx | 2130 | 3700 (600+400+600+1500+600) | 3700 (600+400+600+1500+600) | 600 | 3700 | 3700 | – | – |
| 12 pulse thyristor supply sections (380...500 V Range, $U_N = 500$ V) | | | | | | | | |
| ACA 636-1000-51-xx | 2065 | 2x600 | 2x1200 (600+600) | 600 | 760 | 1020 | – | – |
| ACA 636-1615-51-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| ACA 636-2660-51-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| ACA 636-4030-51-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| ACA 636-4700-51-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| 12 pulse thyristor supply sections with autotransformer (380...500 V Range, $U_N = 500$ V) | | | | | | | | |
| ACA 638-1000-51-xx | 2065 | 4200 | 5400 | 600 | 2460 | 2880 | – | – |
| ACA 638-1615-51-xx | 2130 | 6200 | 6200 | 600 | 4100 | 4100 | – | – |
| ACA 638-2660-51-xx | 2130 | 6600 | 6600 | 600 | 5500 | 5500 | – | – |
| ACA 638-4030-51-xx | 2130 | 8000 | 8000 | 600 | 7500 | 7500 | – | – |
| ACA 638-4700-51-xx | 2130 | 8000 | 8000 | 600 | 7500 | 7500 | – | – |
| 12/6 pulse thyristor supply sections with autotransformer (380...500 V Range, $U_N = 500$ V) | | | | | | | | |
| ACA 639-1000-51-xx | 2065 | 2600 (600+800+600+600) | 3800 | 600 | 1640 | 1900 | – | – |
| ACA 639-1615-51-xx | 2130 | 4800 | 4800 | 600 | 3400 | 3400 | – | – |
| ACA 639-2660-51-xx | 2130 | 5000 | 5000 | 600 | 4100 | 4100 | – | – |
| ACA 639-4030-51-xx | 2130 | 5700 | 5700 | 600 | 5100 | 5100 | – | – |
| ACA 639-4700-51-xx | 2130 | 5700 | 5700 | 600 | 5100 | 5100 | – | – |

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Dimensions and Weights 690 V

The table below shows the dimensions and weights of the 690 V range supply sections. See notes on page A-2.

| Type Marking | Height mm | Bottom Entry: Width mm | Top Entry: Width mm | Depth mm | Bottom Entry: Weight kg | Top Entry: Weight kg | Width (EMC) mm | Weight (EMC) kg |
|--|--------------|------------------------------|-----------------------------|-------------|----------------------------------|-------------------------------|----------------------|-----------------------|
| Diode supply sections (525...690 V Range) | | | | | | | | |
| ACA 631-0090-61-xx | 2065 | 400 | 800 | 600 | 300 | 420 | 400 | 100 |
| ACA 631-0175-61-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | 400 | 100 |
| ACA 631-0250-61-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | 400 | 100 |
| ACA 631-0375-61-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | 600 | 120 |
| ACA 631-0525-61-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | 600 | 120 |
| ACA 631-0850-61-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1300 | 1300 | 600 | 150 |
| ACA 631-1400-61-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1300 | 1300 | - | - |
| ACA 631-2600-61-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1600 | 1600 | - | - |
| ACA 631-3600-61-xx | 2130 | 1600 (600+400+600) | 1600 (600+400+600) | 600 | 1600 | 1600 | - | - |
| Thyristor supply sections (525...690 V Range) | | | | | | | | |
| ACA 632-0090-61-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | - | - |
| ACA 632-0175-61-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | - | - |
| ACA 632-0250-61-xx | 2065 | 400 | 800 (400+400) | 600 | 300 | 420 | - | - |
| ACA 632-0375-61-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | - | - |
| ACA 632-0525-61-xx | 2065 | 600 | 1200 (600+600) | 600 | 380 | 510 | - | - |
| ACA 632-0850-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | - | - |
| ACA 632-1400-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | - | - |
| ACA 632-2600-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | - | - |
| ACA 632-3600-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | - | - |
| Asymmetrical thyristor supply sections (525...690 V Range, $U_N = 690$ V) | | | | | | | | |
| ACA 632-2600/0850-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | - | - |
| ACA 632-2600/1400-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | - | - |
| ACA 632-3600/0850-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | - | - |
| ACA 632-3600/1400-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | - | - |
| ACA 632-3600/2600-61-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | - | - |
| 12 pulse diode supply sections (525...690 V Range) | | | | | | | | |
| ACA 633-0180-61-xx | 2065 | 800 (2x400) | 1600 (2x(400+400)) | 600 | 480 | 720 | - | - |
| ACA 633-0350-61-xx | 2065 | 800 (2x400) | 1600 (2x(400+400)) | 600 | 480 | 720 | - | - |
| ACA 633-0500-61-xx | 2065 | 800 (2x400) | 1600 (2x(400+400)) | 600 | 480 | 720 | - | - |
| ACA 633-0750-61-xx | 2065 | 1200 (2x600) | 2400 (2x(600+600)) | 600 | 640 | 900 | - | - |
| ACA 633-1050-61-xx | 2065 | 1200 (2x600) | 2400 (2x(600+600)) | 600 | 640 | 900 | - | - |
| ACA 633-1700-61-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 2400 | 2400 | - | - |
| ACA 633-2800-61-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 2400 | 2400 | - | - |
| ACA 633-5200-61-xx | 2130 | 3200 (2x(600+400+600)) | 3200 (2x(600+400+600)) | 600 | 3000 | 3000 | - | - |
| 6 pulse thyristor supply sections with autotransformer (525...690 V Range, $U_N = 690$ V) | | | | | | | | |
| ACA 634-1400-61-xx | 2130 | 3200 (600+400+600+1000+600) | 3200 (600+400+600+1000+600) | 600 | 2700 | 2700 | - | - |
| ACA 634-2600-61-xx | 2130 | 3700 (600+400+600+1500+600) | 3700 (600+400+600+1500+600) | 600 | 3700 | 3700 | - | - |
| ACA 634-3600-61-xx | 2130 | 3700 (600+400+600+1500+600) | 3700 (600+400+600+1500+600) | 600 | 3700 | 3700 | - | - |
| 12 pulse thyristor supply sections (525...690 V Range, $U_N = 690$ V) | | | | | | | | |
| ACA 636-1000-61-xx | 2065 | 2x600 | 2x1200 (600+600) | 600 | 760 | 1020 | - | - |
| ACA 636-1615-61-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | - | - |
| ACA 636-2660-61-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | - | - |
| ACA 636-4950-61-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | - | - |
| ACA 636-6500-61-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | - | - |
| 12 pulse thyristor supply sections with autotransformer (525...690 V Range, $U_N = 690$ V) | | | | | | | | |
| ACA 638-1615-61-xx | 2130 | 6200 | 6200 | 600 | 4100 | 4100 | - | - |
| ACA 638-2660-61-xx | 2130 | 6600 | 6600 | 600 | 5500 | 5500 | - | - |
| ACA 638-4950-61-xx | 2130 | 8000 | 8000 | 600 | 7500 | 7500 | - | - |
| ACA 638-6500-61-xx | 2130 | 8000 | 8000 | 600 | 7500 | 7500 | - | - |
| 12/6 pulse thyristor supply sections with autotransformer (525...690 V Range, $U_N = 690$ V) | | | | | | | | |
| ACA 639-1615-61-xx | 2130 | 4800 | 4800 | 600 | 3400 | 3400 | - | - |
| ACA 639-2660-61-xx | 2130 | 5000 | 5000 | 600 | 4100 | 4100 | - | - |
| ACA 639-4950-61-xx | 2130 | 5700 | 5700 | 600 | 5100 | 5100 | - | - |
| ACA 639-6500-61-xx | 2130 | 5700 | 5700 | 600 | 5100 | 5100 | - | - |

PDM code 00001749-C

Dimensions and Weights 830 V

The table below shows the dimensions and weights of the 830 V supply sections. See notes on page A-2.

| Type Marking | Height mm | Bottom Entry: Width mm | Top Entry: Width mm | Depth mm | Bottom Entry: Weight kg | Top Entry: Weight kg | Width (EMC) mm | Weight (EMC) kg |
|---|--------------|------------------------------|---------------------------|-------------|----------------------------------|-------------------------------|----------------------|-----------------------|
| Thyristor supply sections (830 V) | | | | | | | | |
| ACA 632-1680-81-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | – | – |
| ACA 632-3100-81-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | – | – |
| ACA 632-3520-81-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-4210-81-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| Asymmetrical thyristor supply sections (525...830 V Range, $U_N = 830$ V) | | | | | | | | |
| ACA 632-3100/1680-81-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1500 | 1500 | – | – |
| ACA 632-3520/1680-81-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| ACA 632-4310/1680-81-xx | 2130 | 2200 (600+400+600+600) | 2200 (600+400+600+600) | 600 | 1900 | 1900 | – | – |
| 12 pulse thyristor supply sections (525...830 V Range, $U_N = 830$ V) | | | | | | | | |
| ACA 636-3190-81-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| ACA 636-5890-81-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| ACA 636-8190-81-xx | 2130 | 4600 | 4600 | 600 | 3100 | 3100 | – | – |
| 12/6 pulse thyristor supply sections (525...830 V Range, $U_N = 830$ V) | | | | | | | | |
| ACA 637-3190-81-xx | 2130 | 4000 | 4000 | 600 | 2900 | 2900 | – | – |
| ACA 637-5890-81-xx | 2130 | 4000 | 4000 | 600 | 2900 | 2900 | – | – |
| ACA 637-8190-81-xx | 2130 | 4000 | 4000 | 600 | 2900 | 2900 | – | – |

PDM code 00001749-C

Drive Section Tables

The following tables specify the ratings for the drive sections.

Notes The notes concerning the following drive section tables are listed below.

P_{loss} P_{loss} is the heat loss of a unit with basic options.

Noise Level Noise level applies to echoless room.

Height The height of the cabinet for IP 21/22/42 classification is 2065 mm up to frame type R7i. The height of frame type R8i and above is 2130 mm. Cabinet height is 2072 mm for IP 54R classification.

Depth The depth of the cabinet is 600 mm.

Width and Weight

| Note | Description | Weight kg |
|------|---|-----------|
| 1 | 200 mm is added with the top exit | 40 |
| 2 | 400 mm is added with the top exit | 110 |
| 3 | 600 mm is added with the top exit | 160 |
| 4 | 800 mm is added with the top exit and/or common motor connection terminals | 230 |
| 5 | 600 mm is added with the top exit and/or common motor connection terminals | 190 |
| 6 | The width is 400 mm with no options and 600 mm when optional devices are included. 600 mm is added when more than one inverter unit is used in the drive section. | |
| 7 | 200 mm wide joining cabinet is added (max. transportation length is 4000 mm) | 40 |

PDM code 00004863-D

Ratings 400 V The table below shows the nominal ratings for the 400 V range drive sections.

| Type Marking | Nominal Ratings | | | Duty Cycle (10 s / 60 s) | | Duty Cycle (1 min / 5 min) | | Frame type | P_{loss} kW | Air flow m ³ /h | Noise level dBA | Width mm | Weight kg | Notes |
|---|-----------------|-------------|---------------|-----------------------------|-----------------|-------------------------------|-----------------|---------------|----------------------|-----------------------------------|---------------------------|-----------------|------------------|-------|
| | S_N kVA | P_N kW | I_{2N} A | I_{2base} A | I_{2max} A | I_{2base} A | I_{2max} A | | | | | | | |
| Drive sections (380...500 V Range, $U_N = 400$ V) | | | | | | | | | | | | | | |
| ACA 610-05/00/00-3 | 5 | 3 | 7.6 | 6.2 | 12 | 6.2 | 9.3 | R2i | 0.08 | 40 | 48 | 400 | 170 | 1 |
| ACA 610-05/05/00-3 | | | | | | | | 2xR2i | 0.16 | 80 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-05/05/05-3 | | | | | | | | 3xR2i | 0.24 | 120 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-06/00/00-3 | 6 | 4 | 11 | 7.6 | 15 | 7.6 | 11 | R2i | 0.09 | 40 | 48 | 400 | 170 | 1 |
| ACA 610-06/06/00-3 | | | | | | | | 2xR2i | 0.18 | 80 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-06/06/06-3 | | | | | | | | 3xR2i | 0.27 | 120 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-09/00/00-3 | 9 | 5.5 | 15 | 11 | 22 | 11 | 17 | R2i | 0.14 | 40 | 48 | 400 | 170 | 1 |
| ACA 610-09/09/00-3 | | | | | | | | 2xR2i | 0.28 | 80 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-09/09/09-3 | | | | | | | | 3xR2i | 0.42 | 120 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-11/00/00-3 | 11 | 7.5 | 18 | 15 | 30 | 15 | 23 | R3i | 0.17 | 60 | 48 | 400 | 180 | 1 |
| ACA 610-11/11/00-3 | | | | | | | | 2xR3i | 0.34 | 120 | 50 | 400 or 600 | 220 | 1, 6 |
| ACA 610-11/11/11-3 | | | | | | | | 3xR3i | 0.51 | 180 | 51 | 400 or 600 | 230 | 1, 6 |
| ACA 610-16/00/00-3 | 16 | 11 | 24 | 18 | 36 | 18 | 27 | R3i | 0.24 | 60 | 48 | 400 | 180 | 1 |
| ACA 610-16/16/00-3 | | | | | | | | 2xR3i | 0.48 | 120 | 50 | 400 or 600 | 220 | 1, 6 |
| ACA 610-16/16/16-3 | | | | | | | | 3xR3i | 0.72 | 180 | 51 | 400 or 600 | 230 | 1, 6 |
| ACA 610-020/000-3 | 20 | 15 | 32 | 24 | 48 | 24 | 36 | R4i | 0.30 | 70 | 54 | 400 | 190 | 1 |
| ACA 610-020/020-3 | | | | | | | | 2xR4i | 0.60 | 140 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-025/000-3 | 25 | 18.5 | 41 | 32 | 64 | 32 | 48 | R4i | 0.38 | 100 | 54 | 400 | 190 | 1 |
| ACA 610-025/025-3 | | | | | | | | 2xR4i | 0.76 | 200 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-030/000-3 | 30 | 22 | 47 | 41 | 82 | 41 | 62 | R5i | 0.45 | 260 | 54 | 400 | 190 | 1 |
| ACA 610-030/030-3 | | | | | | | | 2xR5i | 0.90 | 520 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-040/000-3 | 40 | 30 | 62 | 47 | 94 | 47 | 71 | R5i | 0.60 | 260 | 54 | 400 | 190 | 1 |
| ACA 610-040/040-3 | | | | | | | | 2xR5i | 1.20 | 520 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-050/000-3 | 50 | 37 | 76 | 62 | 124 | 62 | 93 | R5i | 0.75 | 260 | 54 | 400 | 190 | 1 |
| ACA 610-050/050-3 | | | | | | | | 2xR5i | 1.50 | 520 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-060/000-3 | 60 | 45 | 89 | 76 | 152 | 76 | 114 | R6i | 0.90 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-060/060-3 | | | | | | | | 2xR6i | 1.80 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-070/000-3 | 70 | 55 | 112 | 89 | 178 | 89 | 134 | R6i | 1.05 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-070/070-3 | | | | | | | | 2xR6i | 2.10 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-100/000-3 | 100 | 75 | 147 | 112 | 224 | 112 | 168 | R7i | 1.50 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-100/100-3 | | | | | | | | 2xR7i | 3.00 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-120/000-3 | 120 | 90 | 178 | 147 | 294 | 147 | 221 | R7i | 1.80 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-120/120-3 | | | | | | | | 2xR7i | 3.60 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-0185-3 | 180 | 135 | 259 | 178 | 356 | 194 | 291 | R8i | 2.70 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0225-3 | 220 | 165 | 312 | 216 | 432 | 234 | 351 | R8i | 3.30 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0265-3 | 260 | 200 | 379 | 260 | 520 | 284 | 426 | R8i | 3.90 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0335-3 | 330 | 250 | 474 | 316 | 632 | 356 | 533 | R9i | 4.95 | 1550 | 61 | 600 | 270 | 2 |
| ACA 610-0405-3 | 400 | 315 | 576 | 395 | 790 | 432 | 648 | R9i | 6.00 | 1550 | 61 | 600 | 270 | 2 |
| ACA 610-0500-3 | 500 | 400 | 720 | 494 | 988 | 540 | 810 | R10i | 7.50 | 3100 | 66 | 1000 | 450 | 2 |
| ACA 610-0630-3 | 630 | 500 | 907 | 600 | 1200 | 680 | 1020 | R11i | 9.45 | 3100 | 66 | 1000 | 480 | 2 |
| ACA 610-0765-3 | 760 | 630 | 1094 | 751 | 1502 | 821 | 1231 | R11i | 11.40 | 3100 | 66 | 1000 | 480 | 2 |
| ACA 610-0935-3 | 930 | - | 1336 | 901 | 1802 | 1002 | 1503 | R12i | 13.95 | 4650 | 69 | 1500 | 950 | 3 |
| ACA 610-1125-3 | 1120 | - | 1624 | 1126 | 2252 | 1218 | 1827 | R12i | 16.80 | 4650 | 69 | 1500 | 950 | 3 |
| ACA 610-1440-3 | 1440 | - | 2079 | 1501 | 3002 | 1559 | 2339 | 2xR11i | 21.60 | 6200 | 69 | 2x1000 | 1200 | 3, 5 |
| ACA 610-1775-3 | 1770 | - | 2558 | 1801 | 3602 | 1919 | 2878 | 2xR12i | 26.55 | 9300 | 71 | 2x1500 | 1900 | 4 |
| ACA 610-2145-3 | 2140 | - | 3085 | 2252 | 4504 | 2314 | 3471 | 2xR12i | 32.10 | 9300 | 71 | 2x1500 | 1900 | 4 |
| ACA 610-2340-3 | 2340 | - | 3374 | 2402 | 4804 | 2531 | 3796 | 4xR11i | 35.10 | 12400 | 71 | 4x1000 | 2400 | 4 |
| ACA 610-2820-3 | 2820 | - | 4070 | 3002 | 6004 | 3053 | 4579 | 4xR11i | 42.30 | 12400 | 71 | 4x1000 | 2400 | 4 |

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Ratings 500 V The table below shows the nominal ratings for the 500 V range drive sections.

| Type Marking | Nominal Ratings | | | Duty Cycle (10 s / 60 s) | | Duty Cycle (1 min / 5 min) | | Frame type | P _{loss} kW | Air flow m ³ /h | Noise level dBA | Width mm | Weight kg | Notes |
|--|-----------------------|----------------------|----------------------|--------------------------|------------------------|----------------------------|------------------------|------------|-------------------------|-------------------------------|--------------------|-------------|--------------|-------|
| | S _N kVA | P _N kW | I _{2N} A | I _{2base} A | I _{2max} A | I _{2base} A | I _{2max} A | | | | | | | |
| Drive sections(380...500 V Range, U _N = 500 V) | | | | | | | | | | | | | | |
| ACA 610-06/00/00-5 | 6 | 4 | 7.6 | 6.2 | 12 | 6.2 | 9.3 | R2i | 0.09 | 40 | 48 | 400 | 170 | 1, |
| ACA 610-06/06/00-5 | | | | | | | | 2xR2i | 0.18 | 80 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-06/06/06-5 | | | | | | | | 3xR2i | 0.27 | 120 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-09/00/00-5 | 9 | 5.5 | 11 | 7.6 | 15 | 7.6 | 11 | R2i | 0.14 | 40 | 48 | 400 | 170 | 1 |
| ACA 610-09/09/00-5 | | | | | | | | 2xR2i | 0.28 | 80 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-09/09/09-5 | | | | | | | | 3xR2i | 0.42 | 120 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-11/00/00-5 | 11 | 7.5 | 15 | 11 | 22 | 11 | 17 | R2i | 0.17 | 40 | 48 | 400 | 170 | 1 |
| ACA 610-11/11/00-5 | | | | | | | | 2xR2i | 0.34 | 80 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-11/11/11-5 | | | | | | | | 3xR2i | 0.51 | 120 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-16/00/00-5 | 16 | 11 | 18 | 15 | 30 | 15 | 23 | R3i | 0.24 | 60 | 48 | 400 | 180 | 1 |
| ACA 610-16/16/00-5 | | | | | | | | 2xR3i | 0.48 | 120 | 50 | 400 or 600 | 220 | 1, 6 |
| ACA 610-16/16/16-5 | | | | | | | | 3xR3i | 0.72 | 180 | 51 | 400 or 600 | 230 | 1, 6 |
| ACA 610-20/00/00-5 | 20 | 15 | 24 | 18 | 36 | 18 | 27 | R3i | 0.30 | 60 | 48 | 400 | 180 | 1 |
| ACA 610-20/20/00-5 | | | | | | | | 2xR3i | 0.60 | 120 | 50 | 400 or 600 | 220 | 1, 6 |
| ACA 610-20/20/20-5 | | | | | | | | 3xR3i | 0.90 | 180 | 51 | 400 or 600 | 230 | 1, 6 |
| ACA 610-025/000-5 | 25 | 18.5 | 31 | 24 | 48 | 24 | 36 | R4i | 0.38 | 70 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-025/025-5 | | | | | | | | 2xR4i | 0.76 | 140 | 54 | 400 | 190 | 1 |
| ACA 610-030/000-5 | 30 | 22 | 41 | 31 | 62 | 31 | 47 | R4i | 0.45 | 100 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-030/030-5 | | | | | | | | 2xR4i | 0.90 | 200 | 54 | 400 | 190 | 1 |
| ACA 610-040/000-5 | 40 | 30 | 47 | 41 | 82 | 41 | 62 | R5i | 0.60 | 260 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-040/040-5 | | | | | | | | 2xR5i | 1.20 | 520 | 54 | 400 | 190 | 1 |
| ACA 610-050/000-5 | 50 | 37 | 58 | 47 | 94 | 47 | 71 | R5i | 0.75 | 260 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-050/050-5 | | | | | | | | 2xR5i | 1.50 | 520 | 54 | 400 | 190 | 1 |
| ACA 610-060/000-5 | 60 | 45 | 65 | 58 | 116 | 58 | 87 | R5i | 0.90 | 260 | 54 | 400 or 600 | 240 | 1, 6 |
| ACA 610-060/060-5 | | | | | | | | 2xR5i | 1.80 | 520 | 54 | 400 | 190 | 1 |
| ACA 610-070/000-5 | 70 | 55 | 84 | 65 | 130 | 65 | 98 | R6i | 1.05 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-070/070-5 | | | | | | | | 2xR6i | 2.10 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-100/000-5 | 100 | 75 | 112 | 84 | 168 | 84 | 126 | R6i | 1.50 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-100/100-5 | | | | | | | | 2xR6i | 3.00 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-120/000-5 | 120 | 90 | 135 | 112 | 224 | 112 | 168 | R7i | 1.80 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-120/120-5 | | | | | | | | 2xR7i | 3.60 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-140/000-5 | 140 | 110 | 164 | 135 | 270 | 135 | 203 | R7i | 2.10 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-140/140-5 | | | | | | | | 2xR7i | 4.20 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-0215-5 | 210 | 160 | 246 | 164 | 328 | 185 | 277 | R8i | 3.15 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0255-5 | 250 | 200 | 295 | 200 | 400 | 221 | 332 | R8i | 3.75 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0325-5 | 320 | 250 | 368 | 240 | 480 | 276 | 414 | R8i | 4.80 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0395-5 | 390 | 315 | 448 | 300 | 600 | 336 | 504 | R9i | 5.85 | 1550 | 61 | 600 | 270 | 2 |
| ACA 610-0495-5 | 490 | 400 | 565 | 365 | 730 | 424 | 636 | R9i | 7.35 | 1550 | 61 | 600 | 270 | 2 |
| ACA 610-0610-5 | 610 | 500 | 700 | 456 | 912 | 525 | 788 | R10i | 9.15 | 3100 | 66 | 1000 | 450 | 2 |
| ACA 610-0770-5 | 770 | 630 | 887 | 570 | 1140 | 665 | 998 | R11i | 11.55 | 3100 | 66 | 1000 | 480 | 2 |
| ACA 610-0935-5 | 930 | - | 1073 | 694 | 1388 | 805 | 1207 | R11i | 13.95 | 3100 | 66 | 1000 | 480 | 2 |
| ACA 610-1095-5 | 1090 | - | 1263 | 855 | 1710 | 947 | 1421 | R12i | 16.35 | 4650 | 69 | 1500 | 950 | 3 |
| ACA 610-1385-5 | 1380 | - | 1593 | 1040 | 2080 | 1195 | 1792 | R12i | 20.70 | 4650 | 69 | 1500 | 950 | 3 |
| ACA 610-1760-5 | 1760 | - | 2039 | 1387 | 2774 | 1529 | 2294 | 2xR11i | 26.40 | 6200 | 69 | 2x1000 | 1200 | 3, 5 |
| ACA 610-2165-5 | 2160 | - | 2501 | 1710 | 3420 | 1876 | 2814 | 2xR12i | 32.40 | 9300 | 71 | 2x1500 | 1900 | 4 |
| ACA 610-2625-5 | 2620 | - | 3026 | 2081 | 4162 | 2270 | 3404 | 2xR12i | 39.30 | 9300 | 71 | 2x1500 | 1900 | 4 |
| ACA 610-2850-5 | 2850 | - | 3300 | 2280 | 4560 | 2475 | 3713 | 4xR11i | 42.75 | 12400 | 71 | 4x1000 | 2400 | 4, 7 |
| ACA 610-3450-5 | 3450 | - | 3992 | 2774 | 5548 | 2994 | 4491 | 4xR11i | 51.75 | 12400 | 71 | 4x1000 | 2400 | 4, 7 |

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Ratings 690 V The table below shows the nominal ratings for the 690 V range drive sections.

| Type Marking | Nominal Ratings | | | Duty Cycle (10 s / 60 s) | | Duty Cycle (1 min / 5 min) | | Frame type | P_{loss} kW | Air flow m ³ /h | Noise level dBA | Width mm | Weight kg | Notes |
|---|-----------------|-------------|---------------|--------------------------|-----------------|----------------------------|-----------------|------------|------------------|-------------------------------|--------------------|-------------|--------------|-------|
| | S_N kVA | P_N kW | I_{2N} A | I_{2base} A | I_{2max} A | I_{2base} A | I_{2max} A | | | | | | | |
| Drive sections (525...690 V Range, $U_N = 690$ V) | | | | | | | | | | | | | | |
| ACA 610-09/00/00-6 | 9 | 5.5 | 7.6 | 6.2 | 12 | 6.2 | 9 | R3i | 0,14 | 60 | 48 | 400 | 170 | 1 |
| ACA 610-09/09/00-6 | | | | | | | | 2xR3i | 0,28 | 120 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-09/09/09-6 | | | | | | | | 3xR3i | 0,42 | 180 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-11/00/00-6 | 11 | 8 | 10 | 8.7 | 17 | 8.7 | 13 | R3i | 0,17 | 60 | 48 | 400 | 170 | 1 |
| ACA 610-11/11/00-6 | | | | | | | | 2xR3i | 0,34 | 120 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-11/11/11-6 | | | | | | | | 3xR3i | 0,51 | 180 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-16/00/00-6 | 16 | 11 | 14 | 10 | 20 | 10 | 15 | R3i | 0,24 | 60 | 48 | 400 | 170 | 1 |
| ACA 610-16/16/00-6 | | | | | | | | 2xR3i | 0,48 | 120 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-16/16/16-6 | | | | | | | | 3xR3i | 0,72 | 180 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-20/00/00-6 | 20 | 15 | 20 | 15 | 30 | 15 | 23 | R3i | 0,30 | 60 | 48 | 400 | 170 | 1 |
| ACA 610-20/20/00-6 | | | | | | | | 2xR3i | 0,60 | 120 | 50 | 400 or 600 | 210 | 1, 6 |
| ACA 610-20/20/20-6 | | | | | | | | 3xR3i | 0,90 | 180 | 51 | 400 or 600 | 220 | 1, 6 |
| ACA 610-025/000-6 | 25 | 19 | 25 | 20 | 40 | 20 | 30 | R4i | 0,38 | 70 | 54 | 400 | 240 | 1, 6 |
| ACA 610-025/025-6 | | | | | | | | 2xR4i | 0,76 | 140 | 54 | 400 or 600 | 190 | 1 |
| ACA 610-030/000-6 | 30 | 22 | 28 | 25 | 50 | 25 | 38 | R4i | 0,45 | 100 | 54 | 400 | 240 | 1, 6 |
| ACA 610-030/030-6 | | | | | | | | 2xR4i | 0,90 | 200 | 54 | 400 or 600 | 190 | 1 |
| ACA 610-040/000-6 | 40 | 30 | 36 | 28 | 56 | 28 | 42 | R5i | 0,60 | 260 | 54 | 400 | 240 | 1, 6 |
| ACA 610-040/040-6 | | | | | | | | 2xR5i | 1,20 | 520 | 54 | 400 or 600 | 190 | 1 |
| ACA 610-050/000-6 | 50 | 37 | 44 | 36 | 72 | 36 | 54 | R5i | 0,75 | 260 | 54 | 400 | 240 | 1, 6 |
| ACA 610-050/050-6 | | | | | | | | 2xR5i | 1,50 | 520 | 54 | 400 or 600 | 190 | 1 |
| ACA 610-060/000-6 | 60 | 45 | 52 | 44 | 88 | 44 | 66 | R6i | 0,90 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-060/060-6 | | | | | | | | 2xR6i | 1,80 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-070/000-6 | 70 | 55 | 65 | 52 | 104 | 52 | 78 | R6i | 1,05 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-070/070-6 | | | | | | | | 2xR6i | 2,10 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-100/000-6, | 100 | 75 | 88 | 65 | 130 | 65 | 98 | R7i | 1,50 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-100/100-6 | | | | | | | | 2xR7i | 3,00 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-120/000-6 | 120 | 90 | 105 | 88 | 176 | 88 | 132 | R7i | 1,80 | 480 | 64 | 400 | 200 | 1 |
| ACA 610-120/120-6 | | | | | | | | 2xR7i | 3,60 | 960 | 68 | 600 | 250 | 1 |
| ACA 610-0185-6 | 180 | 132 | 149 | 106 | 212 | 112 | 168 | R8i | 2,70 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0205-6 | 210 | 160 | 176 | 127 | 254 | 132 | 198 | R8i | 3,15 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-0255-6 | 250 | 200 | 210 | 150 | 300 | 158 | 236 | R8i | 3,75 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-315-6 | 310 | 250 | 264 | 179 | 358 | 198 | 297 | R8i | 4,65 | 1550 | 61 | 600 | 250 | 2 |
| ACA 610-375-6 | 370 | 315 | 310 | 225 | 450 | 233 | 349 | R9i | 5,55 | 1550 | 61 | 600 | 270 | 2 |
| ACA 610-0485-6 | 490 | 400 | 410 | 265 | 530 | 308 | 461 | R9i | 7,35 | 1550 | 61 | 600 | 270 | 2 |
| ACA 610-600-6 | 600 | 500 | 502 | 340 | 680 | 377 | 565 | R10i | 9,00 | 3100 | 66 | 1000 | 450 | 2 |
| ACA 610-0750-6 | 750 | 630 | 630 | 428 | 856 | 473 | 709 | R11i | 11,25 | 3100 | 66 | 1000 | 480 | 2 |
| ACA 610-900-6 | 900 | - | 755 | 504 | 1008 | 566 | 849 | R11i | 13,50 | 3100 | 66 | 1000 | 480 | 2 |
| ACA 610-1045-6 | 1040 | - | 874 | 641 | 1282 | 656 | 983 | R12i | 15,60 | 4650 | 69 | 1500 | 950 | 3 |
| ACA 610-1385-6 | 1380 | - | 1156 | 755 | 1510 | 867 | 1301 | R12i | 20,70 | 4650 | 69 | 1500 | 950 | 3 |
| ACA 610-1710-6 | 1710 | - | 1435 | 1007 | 2014 | 1076 | 1614 | 2xR11i | 25,65 | 6200 | 69 | 2x1000 | 1200 | 3, 5 |
| ACA 610-2125-6 | 2120 | - | 1777 | 1283 | 2566 | 1333 | 1999 | 2xR12i | 31,80 | 9300 | 71 | 2x1500 | 1900 | 4 |
| ACA 610-2545-6 | 2540 | - | 2129 | 1511 | 3022 | 1597 | 2395 | 2xR12i | 38,10 | 9300 | 71 | 2x1500 | 1900 | 4 |
| ACA 610-2800-6 | 2800 | - | 2344 | 1710 | 3420 | 1758 | 2637 | 4xR11i | 42,00 | 12400 | 71 | 4x1000 | 2400 | 4 |
| ACA 610-3350-6 | 3350 | - | 2809 | 2014 | 4028 | 2107 | 3160 | 4xR11i | 50,25 | 12400 | 71 | 4x1000 | 2400 | 4 |
| ACA 610-3880-6 | 3880 | - | 3251 | 2564 | 5128 | 2438 | 3657 | 4xR12i | 58,20 | 18600 | 72 | 4x1500 | 3800 | 4 |
| ACA 610-5140-6 | 5140 | - | 4300 | 3020 | 6040 | 3225 | 4838 | 4xR12i | 77,10 | 18600 | 72 | 4x1500 | 3800 | 4 |

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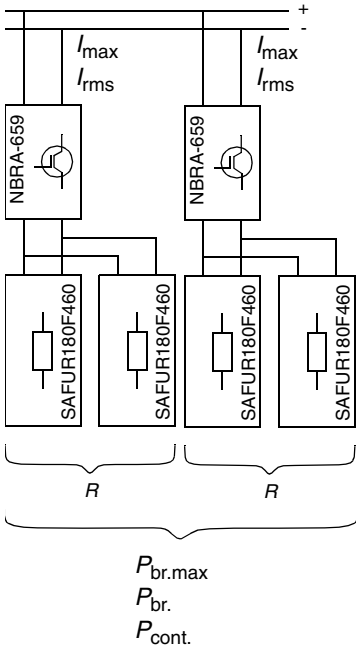
Braking Section Tables

The following tables specify the ratings for the braking sections.

Abbreviations and Notes

The abbreviations and notes concerning the braking section tables are listed below.

Example: ACA 622-0640-3



| Braking Section | |
|-----------------------------------|--|
| $P_{br.max}$ | Maximum braking power per section allowed momentarily |
| R | ACA 621 types: the minimum allowed resistance value for the braking resistor (recommended resistance) per chopper ACA 622 types: Resistance value for the used resistor per braking chopper (resistance of one (2 x SAFURxxxxxxx)) |
| I_{max} | Peak braking current (d.c.) per chopper |
| $P_{cont.}$ | Continuous braking power per section |
| Duty Cycle (10 s / 60 s) | |
| I_{rms} | Total rms d.c. current (per chopper) during a period of 10 seconds with braking power $P_{br.}$ |
| $P_{br.}$ | Short term braking power per section allowed for 10 seconds every 60 seconds |
| | |
| Duty Cycle (1 min / 5 min) | |
| I_{rms} | Total rms d.c. current (per chopper) during a period of 1 minute with braking power $P_{br.}$ |
| $P_{br.}$ | Short term braking power per section allowed for one minute every 5 minutes. |
| | |
| Braking current wave form | |
| | |

Heat loss of the braking chopper is one percent of braking power.

The degree of protection for the SAFUR and NBRA-6xx is IP 00. The SAFUR resistors consist of several resistor elements. The resistance of one element is 8 ohm. The resistors are built in an metal frame.

The degree protection for the braking section cabinets is IP 21/22/42.

Ratings The table below shows the nominal ratings for the dynamic braking sections.

| Section | Chopper | Resistor | $P_{br,max}$ (kW) | R (ohm) | I_{max} (A) | $P_{cont.}$ (kW) | Duty Cycle (1min/5min) | | Duty Cycle (10s/60s) | |
|---|-------------|------------------------|----------------------|--------------|------------------|---------------------|---------------------------|------------------|-------------------------|------------------|
| | | | | | | | $P_{br.}$ (kW) | I_{rms} (A) | $P_{br.}$ (kW) | I_{rms} (A) |
| Braking sections (380...415 V Range, $U_N = 400$ V) | | | | | | | | | | |
| ACA 621-0210-3 | NBRA658 | * | 230 | 1.7 | 384 | 70 | 230 | 355 | 230 | 355 |
| ACA 621-0320-3 | NBRA659 | * | 353 | 1.2 | 545 | 96 | 303 | 468 | 353 | 545 |
| ACA 621-0640-3 | 2 x NBRA659 | * | 706 | 1.2 | 545 | 192 | 606 | 468 | 706 | 545 |
| ACA 621-0960-3 | 3 x NBRA659 | * | 1058 | 1.2 | 545 | 288 | 909 | 468 | 1059 | 545 |
| ACA 621-1280-3 | 4 x NBRA659 | * | 1411 | 1.2 | 545 | 384 | 1212 | 468 | 1412 | 545 |
| ACA 621-1600-3 | 5 x NBRA659 | * | 1764 | 1.2 | 545 | 480 | 1515 | 468 | 1765 | 545 |
| ACA 621-1920-3 | 6 x NBRA659 | * | 2117 | 1.2 | 545 | 576 | 1818 | 468 | 2118 | 545 |
| ACA 622-0210-3 | NBRA658 | 2 x SAFUR210F575 | 230 | 1.7 | 384 | 42 | 130 | 200 | 224 | 345 |
| ACA 622-0320-3 | NBRA659 | 2 x SAFUR180F460 | 353 | 1.2 | 545 | 54 | 167 | 257 | 287 | 444 |
| ACA 622-0640-3 | 2 x NBRA659 | 2 x (2 x SAFUR180F460) | 706 | 1.2 | 545 | 108 | 333 | 257 | 575 | 444 |
| ACA 622-0960-3 | 3 x NBRA659 | 3 x (2 x SAFUR180F460) | 1058 | 1.2 | 545 | 162 | 500 | 257 | 862 | 444 |
| ACA 622-1280-3 | 4 x NBRA659 | 4 x (2 x SAFUR180F460) | 1411 | 1.2 | 545 | 216 | 667 | 257 | 1150 | 444 |
| ACA 622-1600-3 | 5 x NBRA659 | 5 x (2 x SAFUR180F460) | 1764 | 1.2 | 545 | 270 | 833 | 257 | 1437 | 444 |
| ACA 622-1920-3 | 6 x NBRA659 | 6 x (2 x SAFUR180F460) | 2117 | 1.2 | 545 | 324 | 1000 | 257 | 1724 | 444 |
| Braking sections (380...500 V Range, $U_N = 500$ V) | | | | | | | | | | |
| ACA 621-0260-5 | NBRA658 | * | 268 | 2.15 | 380 | 81 | 268 | 331 | 268 | 331 |
| ACA 621-0400-5 | NBRA659 | * | 403 | 1.43 | 571 | 109 | 317 | 391 | 403 | 498 |
| ACA 621-0800-5 | 2 x NBRA659 | * | 806 | 1.43 | 571 | 218 | 634 | 391 | 806 | 498 |
| ACA 621-1200-5 | 3 x NBRA659 | * | 1208 | 1.43 | 571 | 327 | 951 | 391 | 1209 | 498 |
| ACA 621-1600-5 | 4 x NBRA659 | * | 1611 | 1.43 | 571 | 436 | 1268 | 391 | 1612 | 498 |
| ACA 621-2000-5 | 5 x NBRA659 | * | 2014 | 1.43 | 571 | 545 | 1585 | 391 | 2015 | 498 |
| ACA 621-2400-5 | 6 x NBRA659 | * | 2417 | 1.43 | 571 | 654 | 1902 | 391 | 2418 | 498 |
| ACA 622-0260-5 | NBRA658 | 2 x SAFUR125F500 | 268 | 2.00 | 408 | 36 | 111 | 137 | 192 | 237 |
| ACA 622-0400-5 | NBRA659 | 2 x SAFUR200F500 | 403 | 1.35 | 605 | 54 | 167 | 206 | 287 | 355 |
| ACA 622-0800-5 | 2 x NBRA659 | 2 x (2 x SAFUR200F500) | 806 | 1.35 | 605 | 108 | 333 | 206 | 575 | 355 |
| ACA 622-1200-5 | 3 x NBRA659 | 3 x (2 x SAFUR200F500) | 1208 | 1.35 | 605 | 162 | 500 | 206 | 862 | 355 |
| ACA 622-1600-5 | 4 x NBRA659 | 4 x (2 x SAFUR200F500) | 1611 | 1.35 | 605 | 216 | 667 | 206 | 1150 | 355 |
| ACA 622-2000-5 | 5 x NBRA659 | 5 x (2 x SAFUR200F500) | 2014 | 1.35 | 605 | 270 | 833 | 206 | 1437 | 355 |
| ACA 622-2400-5 | 6 x NBRA659 | 6 x (2 x SAFUR200F500) | 2417 | 1.35 | 605 | 324 | 1000 | 206 | 1724 | 355 |
| Braking sections (525...690 V Range, $U_N = 690$ V) | | | | | | | | | | |
| ACA 621-0400-6 | NBRA669 | * | 404 | 2.72 | 414 | 119 | 298 | 267 | 404 | 361 |
| ACA 621-0800-6 | 2 x NBRA669 | * | 807 | 2.72 | 414 | 238 | 596 | 267 | 808 | 361 |
| ACA 621-1200-6 | 3 x NBRA669 | * | 1211 | 2.72 | 414 | 357 | 894 | 267 | 1212 | 361 |
| ACA 621-1600-6 | 4 x NBRA669 | * | 1615 | 2.72 | 414 | 476 | 1192 | 267 | 1616 | 361 |
| ACA 621-2000-6 | 5 x NBRA669 | * | 2019 | 2.72 | 414 | 595 | 1490 | 267 | 2020 | 361 |
| ACA 621-2400-6 | 6 x NBRA669 | * | 2422 | 2.72 | 414 | 714 | 1788 | 267 | 2424 | 361 |
| ACA 622-0400-6 | NBRA669 | 2 x SAFUR200F500 | 404 | 1.35 | 835 | 54 | 167 | 149 | 287 | 257 |
| ACA 622-0800-6 | 2 x NBRA669 | 2 x (2 x SAFUR200F500) | 807 | 1.35 | 835 | 108 | 333 | 149 | 287 | 257 |
| ACA 622-1200-6 | 3 x NBRA669 | 3 x (2 x SAFUR200F500) | 1211 | 1.35 | 835 | 162 | 500 | 149 | 575 | 257 |
| ACA 622-1600-6 | 4 x NBRA669 | 4 x (2 x SAFUR200F500) | 1615 | 1.35 | 835 | 216 | 667 | 149 | 862 | 257 |
| ACA 622-2000-6 | 5 x NBRA669 | 5 x (2 x SAFUR200F500) | 2019 | 1.35 | 835 | 270 | 833 | 149 | 1150 | 257 |
| ACA 622-2400-6 | 6 x NBRA669 | 6 x (2 x SAFUR200F500) | 2422 | 1.35 | 835 | 324 | 2000 | 149 | 1724 | 257 |

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* The ACA 621 braking sections are not equipped with the braking resistors. They must be installed by the user.

Dimensions, Air Flow and Noise

The dimensions, air flows and noise levels for braking sections are given below. The depth of the cabinet is 600 mm. An extra 200 mm wide cabinet is added for top exit ACA 621 units.

| Section | Height (mm) | Width (mm) | Weight (kg) | Noise (dB) | Air flow (m3/h) |
|---|-------------|------------|-------------|------------|-----------------|
| Braking sections (380...415 V Range, $U_N = 400$ V) | | | | | |
| ACA 621-0210-3 | 2065 | 400 | 110 | 64 | 660 |
| ACA 621-0320-3 | 2065 | 400 | 110 | 64 | 660 |
| ACA 621-0640-3 | 2065 | 800 | 220 | 67 | 1320 |
| ACA 621-0960-3 | 2065 | 1200 | 330 | 68 | 1980 |
| ACA 621-1280-3 | 2065 | 1600 | 440 | 69 | 2640 |
| ACA 621-1600-3 | 2065 | 2000 | 550 | 70 | 3300 |
| ACA 621-1920-3 | 2065 | 2400 | 660 | 71 | 3960 |
| ACA 622-0210-3 | 2078 | 1200 | 340 | 66 | 2500 |
| ACA 622-0320-3 | 2078 | 1200 | 340 | 66 | 2500 |
| ACA 622-0640-3 | 2078 | 2400 | 680 | 69 | 5000 |
| ACA 622-0960-3 | 2078 | 3600 | 1020 | 70 | 7500 |
| ACA 622-1280-3 | 2078 | 4800 | 1360 | 71 | 10000 |
| ACA 622-1600-3 | 2078 | 6000 | 1700 | 72 | 12500 |
| ACA 622-1920-3 | 2078 | 7200 | 2040 | 73 | 15000 |
| Braking sections (380...500 V Range, $U_N = 500$ V) | | | | | |
| ACA 621-0260-5 | 2065 | 400 | 110 | 64 | 660 |
| ACA 621-0400-5 | 2065 | 400 | 110 | 64 | 660 |
| ACA 621-0800-5 | 2065 | 800 | 220 | 67 | 1320 |
| ACA 621-1200-5 | 2065 | 1200 | 330 | 68 | 1980 |
| ACA 621-1600-5 | 2065 | 1600 | 440 | 69 | 2640 |
| ACA 621-2000-5 | 2065 | 2000 | 550 | 70 | 3300 |
| ACA 621-2400-5 | 2065 | 2400 | 660 | 71 | 3960 |
| ACA 622-0260-5 | 2078 | 1200 | 340 | 66 | 2500 |
| ACA 622-0400-5 | 2078 | 1200 | 340 | 66 | 2500 |
| ACA 622-0800-5 | 2078 | 2400 | 680 | 69 | 5000 |
| ACA 622-1200-5 | 2078 | 3600 | 1020 | 70 | 7500 |
| ACA 622-1600-5 | 2078 | 4800 | 1360 | 71 | 10000 |
| ACA 622-2000-5 | 2078 | 6000 | 1700 | 72 | 12500 |
| ACA 622-2400-5 | 2078 | 7200 | 2040 | 73 | 15000 |
| Braking sections (525...690 V Range, $U_N = 690$ V) | | | | | |
| ACA 621-0400-6 | 2065 | 400 | 110 | 64 | 660 |
| ACA 621-0800-6 | 2065 | 400 | 110 | 67 | 660 |
| ACA 621-1200-6 | 2065 | 800 | 220 | 68 | 1320 |
| ACA 621-1600-6 | 2065 | 1200 | 330 | 69 | 1980 |
| ACA 621-2000-6 | 2065 | 1600 | 440 | 70 | 2640 |
| ACA 621-2400-6 | 2065 | 2000 | 550 | 71 | 3300 |
| ACA 622-0400-6 | 2078 | 1200 | 340 | 66 | 2500 |
| ACA 622-0800-6 | 2078 | 1200 | 340 | 69 | 5000 |
| ACA 622-1200-6 | 2078 | 2400 | 680 | 70 | 7500 |
| ACA 622-1600-6 | 2078 | 3600 | 1020 | 71 | 10000 |
| ACA 622-2000-6 | 2078 | 4800 | 1360 | 72 | 12500 |
| ACA 622-2400-6 | 2078 | 6000 | 1700 | 73 | 15000 |

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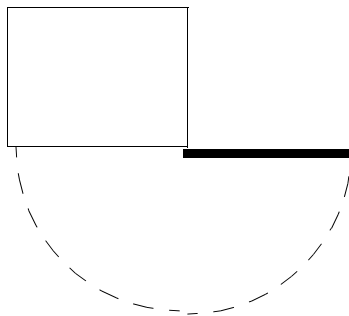
Cabinet

The cabinet, degrees of protection and free space requirements of ACS 600 MultiDrive are listed below.

| <i>ACx 600 Type</i> | <i>Enclosure</i> | <i>Degree of Protection</i> | <i>Space above mm</i> | <i>Space below mm</i> | <i>Space on left/right mm</i> | <i>Space in front/back mm</i> |
|---------------------|------------------|------------------------------------|-----------------------|-----------------------|-------------------------------|-------------------------------|
| ACS 600 MultiDrive | Cabinet | IP 21, IP 22, IP 42, IP 54 R 1) | 500 | 0 | 0 | 200/100 2) |

1) IP 21 = standard, R = air outlet duct

2) 200 between cabinets when installed back to back



Common Cabinet Door Opening

IP 54 R Air Outlet Duct Connection

The dimensions of the duct adjoining to IP 54 R cabinet are below.

| <i>Cabinet Width mm</i> | <i>Duct Ø mm</i> |
|-------------------------|------------------|
| 400 | 250 |
| 600 | 310 |
| 800 | 310 |
| 1000 | 2x310 |
| 1500 | 3x310 |

Input Power Connection

Voltage (U_1):

380/400/415 VAC 3-phase $\pm 10\%$ for 400 VAC units
 380/400/415/440/460/480/500 VAC 3-phase $\pm 10\%$ for 500 VAC units
 525/550/575/600/660/690 VAC 3-phase $\pm 10\%$ for 690 VAC units
 525...830 VAC 3-phase $\pm 10\%$ for 830 VAC units

Short Circuit Capability (IEC 439-1): The rated short time withstand current of ACS 600 MultiDrive is given below.

| Frame Type | $I_{cw} / 1\text{ s}$ (kA) | I_{pk} (kA) |
|-----------------|-------------------------------|------------------|
| B1, B2 | 18 | 38 |
| B3 | 37 | 78 |
| B4, B5 | 50 | 105 |
| B4, B5 optional | 65 | 137 |

Frequency: 48 to 63 Hz, maximum rate of change 17 %/s

Input Voltage Unbalance: $\pm 3\%$ (EN 60204-1)

Power Factor:

Diode and Thyristor Supply Units

($\cos \varphi_1$): 0.97 (fundamental at nominal load)

($\cos \varphi$): 0.93...0.95 (total)

IGBT Supply Units

$\cos \varphi_1 = 1.00$ (fundamental at nominal load)

$\lambda = I_1 / I_{rms} \cdot \cos \varphi_1 > 0.98$ (total) , where

λ is power factor,

I_1 is fundamental input current rms value,

I_{rms} is total input current rms value.

Motor Connection

Voltage (U_2): 0 to U_1 , 3-phase symmetrical.

Frequency: 0 to 300 Hz with 380 to 415 V,
 0 to 120 Hz with 525 to 690 V

Frequency Resolution: 0.01 Hz

Continuous Current: $1.0 \cdot I_{2N}$ (normal use)

Short Term Overload Capacity: see rating tables (valid when output frequency is > 10 Hz)

Field Weakening Point: 8 to 300 Hz

Switching Frequency: 2 kHz (average)

Maximum Recommended Motor Cable Length: For cables longer than 500 metres (cumulative length in case of parallel connected motors), an ABB representative must be consulted. With pulse encoder speed measurement maximum cable length is 300 m. With du/dt filters refer to *du/dt Installation Guide* (code: 58933368). For additional EMC requirements on cable length refer to section *CE Marking* below.

Cable Types: The tables below give the copper and aluminium cable types for different load currents (I_{Lmax}). A correction factor of $K = 0.70$ has been used (max. 9 cables laid on a cable ladder side by side, three ladders on top of each other, ambient temperature 30 °C (86 °F), EN 60204-1 and IEC 364-5-523)

| COPPER CABLES WITH A CONCENTRIC COPPER SCREEN | | |
|--|-------------------|------------------|
| I_{Lmax} [A] | Cable Type | Diameter [mm] |
| 13 | 3×1.5 + 1.5 | 13 |
| 18 | 3×2.5 + 2.5 | 14 |
| 24 | 3×4 + 4 | 16 |
| 30 | 3×6 + 6 | 18 |
| 42 | 3×10 + 10 | 21 |
| 56 | 3×16 + 16 | 23 |
| 71 | 3×25 + 16 | 24 |
| 88 | 3×35 + 16 | 26 |
| 107 | 3×50 + 25 | 29 |
| 137 | 3×70 + 35 | 32 |
| 167 | 3×95 + 50 | 38 |
| 193 | 3×120 + 70 | 41 |
| 223 | 3×150 + 70 | 44 |
| 255 | 3×185 + 95 | 50 |
| 274 | 2 × (3×70 + 35) | 2 × 32 |
| 301 | 3×240 + 120 | 55 |
| 334 | 2 × (3×95 + 50) | 2 × 38 |
| 386 | 2 × (3×120 + 70) | 2 × 41 |
| 446 | 2 × (3×150 + 70) | 2 × 44 |
| 510 | 2 × (3×185 + 95) | 2 × 50 |
| 579 | 3 × (3×120 + 70) | 3 × 41 |
| 602 | 2 × (3×240 + 120) | 2 × 55 |
| 669 | 3 × (3×150 + 70) | 3 × 44 |
| 765 | 3 × (3×185 + 95) | 3 × 50 |
| 772 | 4 × (3×120 + 70) | 4 × 41 |
| 892 | 4 × (3×150 + 70) | 4 × 44 |
| 903 | 3 × (3×240 + 120) | 3 × 55 |
| 1020 | 4 × (3×185 + 95) | 4 × 50 |

| ALUMINIUM CABLES WITH A CONCENTRIC COPPER SCREEN | | |
|---|----------------------|------------------|
| I_{Lmax} [A] | Cable Type | Diameter [mm] |
| 69 | 3×35Al + 10Cu | 26 |
| 83 | 3×50Al + 15Cu | 29 |
| 107 | 3×70Al + 21Cu | 32 |
| 130 | 3×95Al + 29Cu | 38 |
| 151 | 3×120Al + 41Cu | 41 |
| 174 | 3×150Al + 41Cu | 44 |
| 199 | 3×185Al + 57Cu | 49 |
| 214 | 2 × (3×70Al + 21Cu) | 2 × 32 |
| 235 | 3×240Al + 72Cu | 54 |
| 260 | 2 × (3×95Al + 29Cu) | 2 × 38 |
| 302 | 2 × (3×120Al + 41Cu) | 2 × 41 |
| 348 | 2 × (3×150Al + 41Cu) | 2 × 44 |
| 398 | 2 × (3×185Al + 57Cu) | 2 × 49 |
| 470 | 2 × (3×240Al + 72Cu) | 2 × 54 |
| 522 | 3 × (3×150Al + 41Cu) | 3 × 44 |
| 597 | 3 × (3×185Al + 57Cu) | 3 × 49 |
| 696 | 4 × (3×150Al + 41Cu) | 4 × 44 |
| 705 | 3 × (3×240Al + 72Cu) | 3 × 54 |
| 796 | 4 × (3×185Al + 57Cu) | 4 × 49 |
| 940 | 4 × (3×240Al + 72Cu) | 4 × 54 |
| 995 | 5 × (3×185Al + 57Cu) | 5 × 49 |
| 1175 | 5 × (3×240Al + 72Cu) | 5 × 54 |

Bearings of over 90 kW Motors: Insulated bearing at non-driven end is recommended.

Efficiency and Cooling Method

Efficiency: Approximately 98 % at nominal power level and frequency. For units equipped with IGBT supply unit approximately 96 %.

Cooling Method: Internal fan, flow direction from the bottom to the top

Ambient Conditions

Environmental limits of the ACS 600 MultiDrive frequency converters are given below.

| Condition | Operation installed for stationary use | Storage in the protective package | Transportation in the protective package |
|--|---|---|---|
| Installation Site Altitude | Nominal output power at 0 to 1000 m above sea level ¹⁾ | - | - |
| Air Temperature | 0 to +40 °C ²⁾ (IP 21/22/42) 0 to +35 °C ²⁾ (IP 54R) | -40 to +70 °C | -40 to +70 °C |
| Relative Humidity | 5 to 95 % | Max. 95 % | Max. 95 % |
| | No condensation allowed. Maximum allowed relative humidity is 60 % in the presence of corrosive gases. | | |
| Contamination Levels (IEC 721-3-3) | No conductive dust allowed. | | |
| | Boards without coating: Chemical gases: Class 3C1 Solid particles: Class 3S2 Boards with coating: Chemical gases: Class 3C2 Solid particles: Class 3S2 | Boards without coating: Chemical gases: Class 1C2 Solid particles: Class 1S3 Boards with coating: Chemical gases: Class 1C2 Solid particles: Class 1S3 | Boards without coating: Chemical gases: Class 2C2 Solid particles: Class 2S2 Boards with coating: Chemical gases: Class 2C2 Solid particles: Class 2S2 |
| Atmospheric Pressure | 70 to 106 kPa | 70 to 106 kPa | 60 to 106 kPa |
| Vibration (IEC 68-2-6) | Max. 0.3 mm (2 to 9 Hz), max. 1 m/s ² (9 to 200 Hz) sinusoidal | Max. 1.5 mm (2 to 9 Hz), max. 5 m/s ² (9 to 200 Hz) sinusoidal | Max. 3.5 mm (2 to 9 Hz), max. 15 m/s ² (9 to 200 Hz) sinusoidal |
| Shock (IEC 68-2-29) | Not allowed | Max. 100 m/s ² , 11 ms | Max. 100 m/s ² , 11 ms |
| Free Fall | Not allowed | 250 mm (weight under 100 kg) 100 mm (weight over 100 kg) | 250 mm (weight under 100 kg) 100 mm (weight over 100 kg) |

¹⁾ At sites over 1000 m above sea level, the maximum output current is derated as follows.

$$I_{max} = I_{N40C} \cdot (100 \% - 1 \% \cdot (h - 1000 \text{ m}) / (100 \text{ m}) + 1.5 \% \cdot (40 \text{ °C} - T_{amb}))$$

where

h altitude above sea level

I_{N40C} ACS 600 nominal current at 40 °C

T_{amb} maximum ambient temperature.

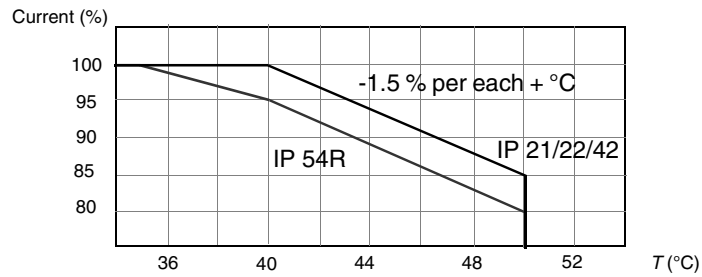
Note: *I_{max}* < *I_{N40C}* and *T_{amb}* < 40 °C. At 2000...4000 m optional “varistors” are needed.

²⁾ If the ambient temperature is higher than +40 °C (+35 °C), the output capacity of the ACx 600 decreases. The output current is calculated by multiplying the current given in the rating table by the derating factor.

Derating factor for degree of protection IP 21/22/42:

- Above +40 °C, the rated output current is decreased 1.5 % for every additional 1 °C (up to +50 °C).
- *Example 1.* If the ambient temperature is 50 °C the derating factor is

$$100\% - 1.5 \frac{\%}{^{\circ}\text{C}} \cdot 10\text{ }^{\circ}\text{C} = 85\% \text{ or } 0.85.$$
 The output current is then $0.85 \cdot I_{2N}$ (or $I_{2\text{base}}$ or $I_{2\text{max}}$).



Derating Diagram: the effect of ambient temperature on the ACS 600 MultiDrive continuous load capacity.

Fuses

The ultrarapid fuses of the ACS 600 MultiDrive are given below. Equivalent fuses from other manufacturers can also be used. Only ultra rapid fuses guarantee proper protection for the rectifier semiconductors. U_N and I_N stand for the nominal voltage and the nominal current of the fuse.

AC Fuses Below are listed a.c. fuses (Bussmann) used in the supply section of ACS 600 MultiDrive frames B1, B2 and B3.

| Thyristor Supply Section | Fuse | | | | | Diode Supply (6-pulse and 12-pulse) Section | Fuse | | | | |
|--|-----------|-----------|---------------------------------|----------|------|--|-----------|-----------|---------------------------------|----------|------|
| | U_N (V) | I_N (A) | Pre-arching Integral (A^2s) | Type | Size | | U_N (V) | I_N (A) | Pre-arching Integral (A^2s) | Type | Size |
| ACA 632-0015-31-xx ACA 632-0020-51-xx | 660 | 50 | 115 | 170M1564 | 000 | | | | | | |
| ACA 632-0030-31-xx ACA 632-0035-51-xx | 660 | 80 | 380 | 170M1566 | 000 | | | | | | |
| ACA 632-0040-31-xx ACA 632-0050-51-xx | 660 | 125 | 1200 | 170M1568 | 000 | | | | | | |
| ACA 632-0070-31-xx ACA 632-0090-51-xx | 660 | 160 | 2300 | 170M1569 | 000 | | | | | | |
| ACA 632-0140-31-xx ACA 632-0175-51-xx | 660 | 315 | 4950 | 170M5806 | 2 | ACA 631-0140-31-xx ACA 633-0280-31-xx ACA 631-0175-51-xx | 660 | 315 | 4950 | 170M5806 | 2 |
| ACA 632-0200-31-xx ACA 634-0200-31-xx ACA 632-0250-51-xx ACA 634-0250-51-xx | 660 | 450 | 15500 | 170M5371 | 2SHT | ACA 631-0200-31-xx ACA 633-0400-31-xx ACA 631-0250-51-xx | 690 | 500 | 21500 | 170M5810 | 2 |
| ACA 632-0300-31-xx ACA 632-0375-51-xx | 660 | 700 | 44500 | 170M6206 | 3SHT | ACA 631-0300-31-xx ACA 633-0600-31-xx ACA 631-0375-51-xx | 690 | 800 | 69500 | 170M6812 | 3 |
| ACA 632-0420-31-xx ACA 634-0420-31-xx ACA 636-0800-31-xx ACA 638-0800-31-xx ACA 639-0800-31-xx ACA 632-0525-51-xx ACA 636-1000-51-xx ACA 638-1000-51-xx ACA 639-1000-51-xx | 660 | 900 | 100000 | 170M6207 | 3SHT | ACA 631-0420-31-xx ACA 633-0840-31-xx ACA 631-0525-51-xx | 660 | 900 | 100000 | 170M6207 | 3SHT |
| ACA 632-0090-61-xx ACA 633-0180-61-xx ACA 632-0175-61-xx ACA 633-0350-61-xx | 1250 | 200 | 3800 | 170M4700 | 1SHT | ACA 631-0090-61-xx | 690 | 200 | 1200 | 170M5804 | 2 |
| ACA 632-0250-61-xx | 1250 | 315 | 13000 | 170M5403 | 2SHT | ACA 631-0175-61-xx | 690 | 200 | 1200 | 170M5804 | 2 |
| ACA 632-0375-61-xx | 1250 | 400 | 23000 | 170M5404 | 2SHT | ACA 631-0250-61-xx | 690 | 350 | 10000 | 170M3818 | 1* |
| ACA 632-0525-61-xx ACA 636-1000-61-xx | 1250 | 630 | 83500 | 170M6205 | 3SHT | ACA 631-0375-61-xx | 690 | 630 | 41000 | 170M5812 | 2 |
| | | | | | | ACA 631-0525-61-xx | 690 | 800 | 69500 | 170M6812 | 3 |
| | | | | | | ACA 633-0180-61-xx | 690 | 200 | 1200 | 170M5804 | 2 |
| | | | | | | ACA 633-0350-61-xx | 690 | 200 | 1200 | 170M5804 | 2 |
| | | | | | | ACA 633-0500-61-xx | 690 | 350 | 10000 | 170M3818 | 1* |
| | | | | | | ACA 633-0750-61-xx | 690 | 630 | 41000 | 170M5812 | 2 |
| | | | | | | ACA 633-1050-61-xx | 690 | 800 | 69500 | 170M6812 | 3 |

PDM code 00010321-K

Branch Fuses Frame B4 to B5 diode and thyristor supply modules employ internal branch fuses instead of input or output fuses. The table lists the applicable Bussmann types.

| Branch Fuses for Frame B4 and B5 Supply Modules | | | | | |
|--|---------------------------------|---------------------------------|---|-------------|-------------|
| Supply Module Type | U_N (V) | I_N (A) | Pre-arcing Integral (A²s) | Type | Size |
| ACN 654 0855 5 ACN 664 0855 5 ACN 684 0855 5 | 660 | 900 | 100000 | 170M6163 | 3/110 |
| ACN 654 1405 5 ACN 664 1405 5 ACN 684 1405 5 | 660 | 1500 | 460000 | 170M6168 | 3/110 |
| ACN 654 2120 5 ACN 664 2120 5 ACN 684 2120 5 | | | | | |
| ACN 654 2600 5 ACN 664 2600 5 ACN 684 2600 5 | | | | | |
| ACN 654 0855 6 ACN 664 0855 6 ACN 684 0855 6 | 1250 | 630 | 83500 | 170M6144 | 3/110 |
| ACN 654 1405 6 ACN 664 1405 6 ACN 684 1405 6 | 1250 | 1100 | 575000 | 170M6149 | 3/110 |
| ACN 654 2600 6 ACN 664 2600 6 ACN 684 2600 6 | | | | | |
| ACN 654 3600 6 ACN 664 3600 6 ACN 684 3600 6 | 1110 | 1400 | 1250000 | 170M6151 | 3/110 |
| ACN 654 1685 8 ACN 664 1685 8 | 1250 | 1100 | 575000 | 170M6149 | 3/110 |
| ACN 654 3100 8 ACN 664 3100 8 | | | | | |
| ACN 654 3520 8 ACN 664 3520 8 | 1110 | 1400 | 1250000 | 170M6151 | 3/110 |
| ACN 654 4310 8 ACN 664 4310 8 | | | | | |

PDM code 00004021-B

Supply DC Fuses Below are listed Bussmann d.c. fuses used in the thyristor supply section of ACS MultiDrive frames B1, B2 and B3.

| Thyristor Supply Section | Fuse | | | | |
|--|-----------|-----------|--|----------|------|
| | U_N (V) | I_N (A) | Pre-arcing Integral (A ² s) | Type | Size |
| 400 V and 500 V Supply | | | | | |
| ACA 632-0015-31-xx ACA 632-0020-51-xx ACA 632-0030-31-xx ACA 632-0035-51-xx | 1250 | 63 | | 170M4722 | 1* |
| ACA 632-0040-31-xx ACA 632-0050-51-xx | 1250 | 100 | | 170M4724 | 1* |
| ACA 632-0070-31-xx ACA 632-0090-51-xx | 1250 | 160 | 1900 | 170M4699 | 1* |
| ACA 632-0140-31-xx ACA 632-0175-51-xx | 1250 | 315 | 13000 | 170M5140 | 2 |
| ACA 632-0200-31-xx ACA 634-0200-31-xx ACA 632-0250-51-xx ACA 634-0250-51-xx | 1250 | 400 | 23000 | 170M5142 | 2 |
| ACA 632-0300-31-xx ACA 632-0375-51-xx | 1250 | 630 | 115000 | 170M5146 | 2 |
| ACA 632-0420-31-xx ACA 634-0420-31-xx ACA 636-0800-31-xx ACA 638-0800-31-xx ACA 639-0800-31-xx ACA 632-0525-51-xx ACA 636-1000-51-xx ACA 638-1000-51-xx ACA 639-1000-51-xx | 1250 | 800 | 245000 | 170M5148 | 2 |
| 690 V Supply | | | | | |
| ACA 632-0090-61-xx ACA 633-0180-61-xx ACA 632-0175-61-xx ACA 633-0350-61-xx | 1250 | 200 | 3800 | 170M4139 | 1 |
| ACA 632-0250-61-xx | 1250 | 315 | 13000 | 170M5140 | 2 |
| ACA 632-0375-61-xx | 1250 | 400 | 23000 | 170M5142 | 2 |
| ACA 632-0525-61-xx ACA 636-1000-61-xx | 1250 | 630 | 115000 | 170M5146 | 2 |

PDM code 000010321-K

Drive Unit DC Fuses Below are listed Bussmann fuses used in the inverters of ACS MultiDrive.

| Drive Section Frame | Fuse | | | | | Drive Section Frame/Type | Fuse | | | | |
|--|-----------|------|-----------|--------------------------------|----------|---|-----------|------|-----------|--------------------------------|----------|
| | U_N (V) | Size | I_N (A) | Pre-arcing Integral (A^2s) | Type | | U_N (V) | Size | I_N (A) | Pre-arcing Integral (A^2s) | Type |
| 415 V and 500 V Range | | | | | | 690 V Range | | | | | |
| R2i | 660V | 000 | 25 | 19 | 170M1561 | R3i: ACA-610-0009-6 ACA-610-0011-6 | 1000V | 00 | 25 | 29 | 170M2674 |
| R3i | 660V | 000 | 50 | 115 | 170M1564 | R3i: ACA-610-0016-6 ACA-610-0020-6 | 1000V | 00 | 35 | 69 | 170M2676 |
| R4i | 660V | 000 | 80 | 380 | 170M1566 | R4i | 1000V | 00 | 63 | 380 | 170M2679 |
| R5i | 660V | 000 | 160 | 2300 | 170M1569 | R5i | 1000V | 00 | 80 | 815 | 170M2680 |
| R6i | 660V | 000 | 200 | 4200 | 170M1570 | R6i | 1000V | 00 | 125 | 3000 | 170M2682 |
| R7i | 660V | 1* | 350 | 10000 | 170M3818 | R7i | 1250V | 1SHT | 200 | 3800 | 170M4700 |
| R8i R10i | 660V | 3 | 630 | 31000 | 170M6810 | R8i: ACA-610-0185-6 ACA-610-0205-6 | 1250V | 3SHT | 315 | 9500 | 170M6301 |
| R9i R11i 2xR11 4xR11i R12i 2xR12i | 660V | 3 | 1000 | 140000 | 170M6814 | R8i: ACA-610-0255-6 ACA-610-0315-6 R10i | 1250V | 3SHT | 400 | 19500 | 170M6303 |
| | | | | | | R9i R11i 4xR11i R12i 2xR12i 4xR12i | 1250V | 3SHT | 630 | 83500 | 170M6205 |

PDM code 00008855-F

Braking Section DC Fuses

The d.c. fuses (Bussmann) for the braking sections are listed below.

| Dynamic Braking Section | Fuse | | | | |
|--------------------------|--------------|--------------|--|-----------|-------|
| | U_N (V) | I_N (A) | Pre-arcing Integral (A ² s) | Type | Size |
| 400 V Range | | | | | |
| ACA 621-0210-3 | 1000–1250 | 400 | 23000 | 170M 5142 | 2/110 |
| ACA 621-0320-3...-1920-3 | 1000–1250 | 630 | 115000 | 170M 5146 | 2/110 |
| ACA 622-0210-3 | 1000–1250 | 400 | 23000 | 170M 5142 | 2/110 |
| ACA 622-0320-3...-1920-3 | 1000–1250 | 630 | 115000 | 170M 5146 | 2/110 |
| 500 V Range | | | | | |
| ACA 621-0260-5 | 1000–1250 | 400 | 23000 | 170M 5142 | 2/110 |
| ACA 621-0400-5...-2400-3 | 1000–1250 | 630 | 115000 | 170M 5146 | 2/110 |
| ACA 622-0260-5 | 1000–1250 | 400 | 23000 | 170M 5142 | 2/110 |
| ACA 622-0400-5...-2400-5 | 1000–1250 | 630 | 115000 | 170M 5146 | 2/110 |
| 690 V Range | | | | | |
| ACA 621-0400-6...-2400-6 | 1000–1250 | 630 | 115000 | 170M 5146 | 2/110 |
| ACA 622-0400-6...-2400-6 | 1000–1250 | 630 | 115000 | 170M 5146 | 2/110 |

PDM code 00025310-A

Power Cable Entries

Notes concerning the cable entry tables are below.

Tightening Torque

Tightening torques for screw connections (applicable to zinc and chrome platings and screw strength class 8.8) are presented below.

| Screw | Torque (Nm) * | |
|-------|----------------|------------------------------|
| | Soft aluminium | Alloyed aluminium and copper |
| M5 | 3.5 | 3.5 |
| M6 | 6 | 9 |
| M8 | 17 | 20 |
| M10 | 35 | 40 |
| M12 | 55 | 70 |
| M16 | 130 | 180 |

* valid also for greased screws

Marking

Below is explained the way cable connections are marked in the following tables. The terminals accept cable lugs according to DIN 46234 for copper cables and DIN 46329 for aluminium cables.

4x(13x18)

Number of connection holes in terminal _____

Connection hole (max. screw) diameter or dimensions in mm _____

Note: Cable lugs can also be fastened using screws one size down from the hole size. Example: A cable lug with a hole diameter of 12.5 mm can be fastened with either a M12 or a M10 bolt.

Diode Supply Sections The connection holes for cable lugs and bus duct are presented below.

| Type | Holes for cable lugs per phase | Number of cable entries at bottom (diameter 60 mm) | Bottom plate opening dimensions (mm) | Number of cable entries at top (diameter 60 mm) | Holes for bus duct connection |
|---|--------------------------------|--|--------------------------------------|---|-------------------------------|
| U_N = 400V (380V...415V) | | | | | |
| ACA 631-0140-3 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 631-0200-3 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 631-0300-3 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 631-0420-3 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 631-0680-3 | 4x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 631-1120-3 | 8x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 631-1700-3 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 631-2100-3 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| U_N = 500V (380V...500V) | | | | | |
| ACA 631-0175-5 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 631-0250-5 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 631-0375-5 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 631-0525-5 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 631-0850-5 | 4x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 631-1400-5 | 8x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 631-2120-5 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 631-2600-5 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| U_N = 690V (525V...690V) | | | | | |
| ACA 631-0090-6 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 631-0175-6 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 631-0250-6 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 631-0375-6 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 631-0525-6 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 631-0850-6 | 4x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 631-1400-6 | 8x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 631-2600-6 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 631-3600-6 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |

Thyristor Supply Section: Terminal Block Connection The maximum cable size accepted by the terminal block of frame type B1 is given below.

| Types: ACA 632-0015-3 ACA 632-0030-3 ACA 632-0040-3 ACA 632-0070-3 ACA 632-0020-5 ACA 632-0035-5 ACA 632-0050-5 ACA 632-0090-5 | Frame Size B1 | Cable Size | | Tightening Torque | Cable entries at bottom (diameter 60 mm) | Bottom plate opening dimensions | Cable entries at top (diameter 60 mm) |
|--|------------------|-----------------|-----|-------------------|--|---------------------------------|---------------------------------------|
| | | mm ² | AWG | Nm | pcs | mm | pcs |
| | | 70 | 2/0 | 8 | 3 | 310x240 | 3 |

Thyristor Supply Section: Busbar / Bus Duct Connection The connection holes for cable lugs and bus duct are presented below.

| Type | Holes for cable lugs per phase | Number of cable entries at bottom (diameter 60 mm) | Bottom plate opening dimensions (mm) | Number of cable entries at top (diameter 60 mm) | Holes for bus duct connection |
|--|--------------------------------|--|--------------------------------------|---|-------------------------------|
| $U_N = 400V (380V...415V)$ | | | | | |
| ACA 632-0140-3 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 632-0200-3 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 632-0300-3 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 632-0420-3 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 632-0680-3 | 4x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 632-1120-3 | 8x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 632-1700-3 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 632-2100-3 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| $U_N = 500V (380V...500V)$ | | | | | |
| ACA 632-0175-5 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 632-0250-5 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 632-0375-5 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 632-0525-5 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 632-0850-5 | 4x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 632-1400-5 | 8x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 632-2120-5 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 632-2600-5 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| $U_N = 690V (525V...690V)$ | | | | | |
| ACA 632-0090-6 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 632-0175-6 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 632-0250-6 | 2x14 | 3 | 310x240 | 3 | - |
| ACA 632-0375-6 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 632-0525-6 | 4x14 | 6 | 502x280 | 6 | - |
| ACA 632-0850-6 | 4x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 632-1400-6 | 8x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 632-2600-6 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 632-3600-6 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| $U_N = 830V (525V...830V)$ | | | | | |
| ACA 632-1680-8 | 4x(13x18) | 12 | 502x280 | 12 | 4x(13x24) |
| ACA 632-3100-8 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 632-3520-8 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |
| ACA 632-4310-8 | 12x(13x18) | 18 | 502x280 | 18 | 4x(13x24) |

Drive Sections: Terminal Block Connection The maximum cable sizes accepted by the terminal block for motor and brake cable connection (terminals U2, V2, W2, PE, UDC+, UDC-) of frame types R2i to R5i are given below.

| Frame | Cable Size | | | Tightening Torque | Cable entries at bottom (diameter 60 mm) | Bottom plate opening dimensions | Cable entries at top (diameter 60 mm) |
|-------|-----------------|-----------------|-----|-------------------|--|---------------------------------|---------------------------------------|
| | Solid | Stranded | | | | | |
| | mm ² | mm ² | AWG | Nm | pcs | mm | pcs |
| R2i | 10 | 6 | 8 | 1.5...1.8 | 3 | 110x235 | 3 |
| R3i | 16 | 10 | 6 | 1.5...1.8 | 3 | 110x235 | 3 |
| R4i | 25 | 16 | 4 | 1.5...1.8 | 3 | 110x235 | 3 |
| R5i | 35 | 25 | 2 | 4.0...4.5 | 3 | 110x235 | 3 |

Drive Sections: Busbar Connection The connection holes for motor and brake cable lugs (terminals U2, V2, W2, PE, UDC+, UDC-) of the drive sections are presented below.

| Type | Holes for cable lugs per phase | Number of cable entries at bottom (diameter 60 mm) | Bottom plate opening dimensions (mm) | Number of cable entries at top (diameter 60 mm) |
|-------------------------|--------------------------------|--|--------------------------------------|---|
| 380V, 400V, 415V | | | | |
| ACA 610-0060-3 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0070-3 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0100-3 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0120-3 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0185-3 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0225-3 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0265-3 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0335-3 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0405-3 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0500-3 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0630-3 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0760-3 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0935-3 | 8x(13x18) | 12 | 195x501 | 12 |
| ACA 610-1125-3 | 8x(13x18) | 12 | 195x501 | 12 |
| ACA 610-1440-3 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-1775-3 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2145-3 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2340-3 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2820-3 | 16x(13x18) | 18 | 270x711 | 18 |
| 440V, 460V, 500V | | | | |
| ACA 610-0070-5 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0100-5 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0120-5 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0140-5 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0205-5 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0255-5 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0325-5 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0395-5 | 4x(13x18) | 6 | 270x511 | 6 |

| Type | Holes for cable lugs per phase | Number of cable entries at bottom (diameter 60 mm) | Bottom plate opening dimensions (mm) | Number of cable entries at top (diameter 60 mm) |
|-------------------------|--------------------------------|--|--------------------------------------|---|
| ACA 610-0495-5 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0610-5 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0770-5 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0935-5 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-1095-5 | 8x(13x18) | 12 | 195x501 | 12 |
| ACA 610-1385-5 | 8x(13x18) | 12 | 195x501 | 12 |
| ACA 610-1760-5 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2165-5 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2625-5 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2850-5 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-3450-5 | 16x(13x18) | 18 | 270x711 | 18 |
| 575V, 660V, 690V | | | | |
| ACA 610-0060-6 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0070-6 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0100-6 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0120-6 | 1x(13x18) | 3 | 110x235 | 3 |
| ACA 610-0185-6 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0205-6 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0255-6 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0315-6 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0375-6 | 4x(13x18) | 6 | 270x511 | 6 |
| ACA 610-0485-6 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0600-6 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0750-6 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-0900-6 | 6x(13x18) | 6 | 270x911 | 6 |
| ACA 610-1045-6 | 8x(13x18) | 12 | 195x501 | 12 |
| ACA 610-1385-6 | 8x(13x18) | 12 | 195x501 | 12 |
| ACA 610-1710-6 | 8x(13x18) | 12 | 195x501 | 12 |
| ACA 610-2125-6 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2545-6 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-2800-6 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-3350-6 | 16x(13x18) | 18 | 270x711 | 18 |
| ACA 610-3880-6 | 32x(13x18) | 18 | 270x911 | 18 |
| ACA 610-5140-6 | 32x(13x18) | 18 | 270x911 | 18 |

NIOC Board Specifications

Data of the external control connection board NIOC-01 of the ACS 600 product family are given below. NIOC-01 board is included in the drive section of the ACS 600 MultiDrive. For external control connections of the supply section, refer to *Diode/Thyristor/IGBT Supply Sections User's Manual*. For external control connections of the control section, refer to Common Drive Control Manuals.

| | ACS/ACC/ACP 600, ACS 600 MultiDrive NIOC-01 Board |
|--|--|
| <p>Analogue Inputs</p> <p>The advantage of the differential analogue input is that the earth potential of the device or transmitter sending an analogue signal can differ up to ± 15 V from the earth potential of the ACx 600 chassis without disturbing the signal. Differential input also efficiently attenuates common mode disturbances coupled to control cables.</p> | <p>ACS 600, ACS 600 MultiDrive: Two Programmable Differential Current Inputs: 0 (4) to 20 mA, $R_{in} = 100 \Omega$</p> <p>ACC 600: Two Differential Current Inputs: 0 to 20 mA, $R_{in} = 100 \Omega$</p> <p>ACP 600: One Programmable Differential Current Input: 0 to 20 mA, $R_{in} = 100 \Omega$</p> <p>ACS/ACP 600, ACS 600 MultiDrive: One Programmable Differential Voltage Input: ACS 600: 0 (2) to 10 V, $R_{in} > 200 \text{ k}\Omega$; ACP 600: 0 to 10 V, $R_{in} > 200 \text{ k}\Omega$</p> <p>ACC 600: One Differential Voltage Input: 0 to 10 V, $R_{in} > 200 \text{ k}\Omega$</p> <p>Common Mode Voltage: ± 15 VDC, max.</p> <p>Common Mode Rejection Ratio: ≥ 60 dB at 50 Hz</p> <p>Resolution: 0.1 % (10 bit)</p> <p>Inaccuracy: ± 0.5 % (Full Scale Range) at 25 °C. Temperature Coefficient: ± 100 ppm/°C, max.</p> <p>Input Updating Time: 12 ms (ACS 600), 44 ms (ACC 600), 1 ms (ACP 600), 10 ms (ACS 600 MultiDrive)</p> |
| <p>Constant Voltage Output</p> | <p>Voltage: 10 VDC ± 0.5 % (Full Scale Range) at 25 °C. Temperature Coefficient: ± 100 ppm/°C, max.</p> <p>Maximum Load: 10 mA</p> <p>Applicable Potentiometer: 1 kΩ to 10 kΩ</p> |
| <p>Auxiliary Power Output</p> | <p>Voltage: 24 VDC ± 10 %, Short circuit proof</p> <p>Maximum Current: 250 mA or 130 mA with NLMD-01 option</p> |
| <p>Analogue Outputs</p> | <p>ACS/ACC 600, ACS 600 MultiDrive: Two Programmable Current Outputs: 0 (4) to 20 mA, $R_L \leq 700 \Omega$</p> <p>ACP 600: One Programmable Current Output: 0 to 20 mA, $R_L \leq 700 \Omega$</p> <p>Resolution: 0.1 % (10 bit)</p> <p>Inaccuracy: ± 1 % (Full Scale Range) at 25 °C. Temperature Coefficient: ± 200 ppm/°C, max.</p> <p>Output Updating Time: 24 or 100 ms (ACS 600), 44 ms (ACC 600), 8 ms (ACP 600), 10 ms (ACS 600 MultiDrive)</p> |

| | ACS/ACC/ACP 600, ACS 600 MultiDrive NIOC-01 Board |
|------------------------------|---|
| Digital Inputs | <p>ACS/ACP 600, ACS 600 MultiDrive: Six Programmable Digital Inputs (Common Ground): 24 VDC, -15 to +20 %</p> <p>ACC 600: Six Digital Inputs (Common Ground): 24 VDC, -15 to +20 %</p> <p>Logical Thresholds: < 8 VDC $\hat{=}$ "0", > 12 VDC $\hat{=}$ "1"</p> <p>Input Current: DI1 to DI 5: 10 mA, DI6: 5 mA</p> <p>Filtering Time Constant: 1 ms</p> <p>Thermistor Input: 5 mA, < 1.5 kΩ $\hat{=}$ "1" (normal temperature), > 4 kΩ $\hat{=}$ "0" (high temperature), Open Circuit $\hat{=}$ "0" (high temperature)</p> <p>Internal Supply For Digital Inputs (+24 VDC): Short circuit proof, group isolated</p> <p>Isolation Test Voltage: 500 VAC, 1 minute</p> <p>Input Updating Time: 12 ms (ACS 600), 44 ms (ACC 600), 4 ms (ACP 600), 10 ms (ACS 600 MultiDrive)</p> <p>An external 24 VDC supply can be used instead of the internal supply.</p> |
| Digital Outputs | - |
| Relay Outputs | <p>Three Programmable Relay Outputs</p> <p>Switching Capacity: 8 A at 24 VDC or 250 VAC, 0.4 A at 120 VDC</p> <p>Maximum Continuous Current: 2 A rms</p> <p>Contact Material: Silver Cadmium Oxide (AgCdO)</p> <p>Isolation Test Voltage: 4 kVAC, 1 minute</p> <p>Output Updating Time: 100 ms (ACS 600), 44 ms (ACC 600), 8 ms (ACP 600), 10 ms (ACS 600 MultiDrive)</p> |
| DDCS Fibre Optic Link | Protocol: DDCS (ABB Distributed Drives Communication System) |
| Encoder Input | |

Application Programs

Various application programs are available for the ACS 600 frequency converters. Not all selections are available for all types. One application program at a time can be loaded in the memory of the frequency converter.

| ACS 600 Application Programs |
|-------------------------------------|
| Standard |
| CraneDrive |
| MotionControl |
| System |

Protection Features Application program dependent features of the ACx 600 are listed below. ● available as standard, ○ optional. Not all selections are available for all types. For more information refer to the appropriate application program *Firmware Manual*.

| Preprogrammed Faults | Standard PFC, M/F | Crane | Motion Control | System | Programmable Fault Functions | Standard PFC, M/F | Crane | MotionControl | System | Programm. Supervision Functions | Standard PFC, M/F | Crane | Motion Control | System |
|---|-------------------|-------|----------------|--------|------------------------------------|-------------------|-------|---------------|--------|---------------------------------|-------------------|-------|----------------|--------|
| ACx 600 temperature | ● | ● | ● | ● | Analogue input below minimum value | ● | | | | Speed | 2 | | 2 | 2 |
| Overcurrent | ● | ● | ● | ● | Loss of Control Panel | ● | ● | | ● | Motor current | ● | | | ● |
| Short circuit | ● | ● | ● | ● | External fault | ● | ● | ● | ● | Motor torque | 2 | | ● | 2 |
| DC overvoltage | ● | ● | ● | ● | Motor overtemperature | ● | ● | ● | ● | Motor speed | ● | | | ● |
| Supply phase | ● | ● | ● | ● | Thermistor/Pt 100 | ● | ● | ● | ● | Reference 1 | ● | | | |
| DC undervoltage | ● | ● | ● | ● | Motor stalled | ● | | ● | ● | Reference 2 | ● | | | |
| Overfrequency | ● | ● | | ● | Motor underload | ● | | ● | ● | Actual value 1 | ● | | | |
| Loss of Control Panel | | | ● | | Loss of motor phase | ● | ● | ● | ● | Position error | | | ● | |
| Internal fault | ● | ● | ● | ● | Earth fault | ● | ● | ● | ● | Synchron error | | | ● | |
| Internal fault on the I/O control board | ● | ● | ● | ● | Speed measurement | | | ● | | Position threshold | | | 4 | |
| Ambient temperature | ● | ● | ● | ● | Motor overspeed | | ● | | | Joystick | | ● | | |
| User Macro | ● | ● | ● | ● | Torque | | ● | | | Brake long falling time | | ● | | |
| Braking chopper (in fieldbus mode) | | ● | | | Torque proving | | ● | | | | | | | |
| Inverter overload | | ● | | | Master/Follower communication | ● | ● | | | | | | | |
| No motor data | ● | ● | | ● | Brake | | ● | | | | | | | |
| ID Run fail | ● | ● | | ● | Communication test | | | ● | | | | | | |
| Motor fan control and diagnostics | | | | ● | Following error | | | ● | | | | | | |
| | | | | | Position limits | ○ | ○ | ● | ○ | | | | | |
| | | | | | Communication error | | | | | | | | | |
| | | | | | Encoder interface module | ○ | ○ | ● | ○ | | | | | |
| | | | | | Overspeed | | | ● | | | | | | |

Preprogrammed Warnings: ACS 600 temperature, Motor Identification Run, Drive Identification Number change, User Macro, Target position (ACP).

Programmable Automatic Reset Functions (ACS 600 Standard Application Program only): after overcurrent, overvoltage, undervoltage and analogue input below minimum value

Information Functions: ACx 600 control firmware package version, ACx 600 application program version, ACx 600 test date.

Applicable Standards

The ACS 600 MultiDrive complies with the following standards:

- EN 60204-1: 1992 + Corr. 1993 (IEC 204-1). Safety of machinery. Electrical equipment of machines. Part 1: General requirements.
- EN 60529: 1991 (IEC 529), IEC 664-1: 1992. Degrees of protection provided by enclosures (IP code).
- EN 50178: 1986. Electronic equipment for use in power installations.
- EN 61800-3 (1996): EMC product standard including specific test methods.

Materials

| Enclosure | Coating Thickness | Color |
|--|-------------------|--------------------------------|
| hot-dip zinc coated steel sheet 1.0 to 2.5 mm with polyester thermosetting powder coating in outer surface visible parts | 60 µm | RAL 7035 light beige semigloss |
| Flat Busbars | | |
| aluminium (standard), copper (optional), tin plated copper (optional) | | |
| Package | | |
| wood or plywood (seaworthy package). Plastic covering of the package: PE-LD, bands PP or steel. | | |

Transportation

Length: max. 4 metres, weight max. 2400 kg

Position: upright

Max. crate dimensions:

length shipping length + 100 mm

depth shipping split depth + 150 mm

height height + 80 mm

Max. seaworthy dimensions:

length shipping length + 200 mm

depth shipping split depth + 185 mm

height 2200 mm

Disposal

ACx 600 contains raw materials that should be recycled to preserve energy and natural resources. The packing materials of ACx 600 units and options are environmentally compatible and recyclable. All metal parts can be recycled. The plastic parts can either be recycled or burned under controlled circumstances, according to local regulations. If recycling is not feasible, all parts excluding electrolytic capacitors can be landfilled. The DC capacitors of the unit contain electrolyte which is classified as hazardous waste. They must be removed and handled according to local regulations.

For further information on environmental aspects, please contact your local ABB distributor.

CE Marking

A CE mark is attached to ACS 600 MultiDrive frequency converters (380...690 V ranges) to verify that the unit fulfils the European Low Voltage and EMC Directives (Directive 73/23/EEC, as amended by 93/68/EEC and Directive 89/336/EEC, as amended by 93/68/EEC).

Compliance with the EMC Directive

EMC stands for **E**lectromagnetic **C**ompatibility. It is the ability of electrical/electronic equipment to operate without problems within an electromagnetic environment. Likewise, the equipment must not disturb or interfere with any other product or system within its locality.

The EMC Directive defines the requirements for immunity and emissions of electrical equipment used in the European Economic Area. The EMC product standard EN 61800-3 covers the requirements stated for frequency converters.

The ACS 600 MultiDrive frequency converters comply with the EMC Directive in industrial low-voltage network, public low-voltage network (restricted distribution) and IT networks (unearthed mains) with the following provisions.

Industrial Low-Voltage Network

1. It is ensured that no excessive emission is propagated to neighbouring low-voltage networks. In some cases, the natural suppression in transformers and cables is sufficient. If in doubt, the ACS 600 MultiDrive can be equipped with EMC filtering (refer to Table A-1 below) or the supply transformer with static screening between the primary and secondary windings can be used.
2. The ACS 600 MultiDrive is installed according to the instructions given in the *Hardware Manual* (EN code 63700118).
3. The motor and control cables are selected as specified in the *Hardware Manual* (EN code 63700118).

Note: It is recommended to equip the ACS 600 MultiDrive with the EMC filtering if there is equipment sensitive to conducted emission connected to the same supply transformer as the ACS 600 MultiDrive.

**Unearthed Mains
(IT Network)**

1. It is ensured that no excessive emission is propagated to neighbouring low-voltage networks. In some cases, the natural suppression in transformers and cables is sufficient. If in doubt, the supply transformer with static screening between the primary and secondary windings can be used.
2. The ACS 600 MultiDrive is installed according to the instructions given in the *Hardware Manual* (EN code 63700118).
3. The motor and control cables used are selected as specified in the *Hardware Manual* (EN code 63700118).

Note: The ACS 600 MultiDrive must not be equipped with EMC filtering when installed to IT networks. The mains becomes connected to earth potential through the EMC filter capacitors. In IT networks this may cause danger or damage the unit.

Machinery Directive

ACS 600 MultiDrive frequency converters comply with the European Union Machinery Directive (98/37/EC) requirements for an equipment intended to be incorporated into machinery.

CSA Marking

The CSA marking is often required in North America. CSA marked ACS 600 MultiDrive frequency converters are available on request up to 600 V.

The ACS 600 MultiDrive is suitable for use in a circuit capable of delivering not more than 65 kA rms symmetrical amperes at 600 V maximum.

The ACS 600 MultiDrive provides overload protection in accordance with the National Electrical Code (US). See *ACS 600 Firmware Manual* for setting. Default setting is off, must be activated at start-up.

ACS 600 drives are to be used in a heated indoor controlled environment. See subsection [Ambient Conditions](#) for specific limits.

“C-tick”  Marking

A “C-tick” mark is attached to ACS 600 MultiDrive frequency converters to verify that the unit follows the provisions of

- Radiocommunications (Electromagnetic Compatibility) Standard 1998
- Radiocommunications (Compliance Labelling - Incidental Emissions) Notice 1998
- AS/NZS 2064: 1997. Limits and methods of measurement of electronic disturbance characteristics of industrial, scientific and medical (ISM) radiofrequency equipment.
- Radiocommunication Regulations of New Zealand (1993).

**Compliance with AS/
NZS 2064**

The above rules define the essential requirements for emissions of electrical equipment used in Australia and New Zealand. The standard AS/NZS 2064 (Limits and methods of measurement of electronic disturbance characteristics of industrial, scientific and medical radiofrequency equipment, 1997) covers the detailed requirements for three-phase frequency converters.

The ACS 600 MultiDrive frequency converters comply with AS/NZS 2064 for class A equipment (suitable for use in all establishments other than domestic and those directly connected to a low-voltage network which supplies buildings used for domestic purposes). The compliance is valid with the following provisions:

1. The ACS 600 MultiDrive is equipped with EMC filtering (refer to Table A-1).
2. The ACS 600 MultiDrive is installed according to the instructions given in the *Hardware Manual* (EN code 63700118).
3. The motor and control cables used are selected as specified in the *Hardware Manual* (EN code 63700118).
4. Maximum cable length is 100 metres.

Note: The ACS 600 MultiDrive must not be equipped with EMC filtering (refer to Table A-1) when installed to IT networks. The mains becomes connected to earth potential through the EMC filter capacitors. In IT networks this may cause danger or damage the unit.

Equipment Warranty and Liability

General: ABB warrants the Equipment supplied by ABB against defects in material and workmanship for a period of twelve (12) months after installation or twenty-four (24) months from date of shipment from factory, whichever first occurs.

Should any failure to conform with the applicable warranties appear during the specified periods under normal and proper use and provided the Equipment has been properly stored, installed, operated and maintained, and if given prompt notice by Purchaser, ABB shall correct such nonconformity, at its option; by (1) repair or replacement of the nonconforming equipment or parts thereof. Repairs or replacements pursuant to warranty shall not renew or extend the applicable original equipment warranty period, provided however, that any such repairs or replacement of equipment or parts thereof shall be warranted for the time remaining of the original warranty period or 30 days, whichever is longer.

ABB shall not be responsible for providing working access to the defect, including disassembly and reassembly of equipment or for providing transportation to and from repair or factory facility, all of which shall be at Purchaser's risk and expense.

These warranties shall not apply to any Equipment or parts thereof which (1) have been improperly repaired or altered; (2) have been subjected to misuse, negligence or accident; (3) have been used in a manner contrary to ABB's instructions; (4) are comprised of materials provided or designed stipulated by Purchaser; or (5) are used equipment.

The foregoing warranties are exclusive and in lieu of all other warranties of quality and performance, written, oral or implied, and all other warranties including any implied warranties of merchantability or fitness for a particular purpose are hereby disclaimed by ABB and all equipment manufacturers.

Correction of nonconformities in the manner and for the period of time provided above shall be the Purchaser's exclusive remedy and shall constitute fulfilment of all liabilities of ABB and any Equipment manufacturer (including any liability for direct, indirect, special, incidental or consequential damages) whether in warranty, contract, negligence, tort, strict liability, or otherwise with respect to any nonconformance of or defect or deficiency in the equipment supplied or services furnished hereunder.

Limitation of Liability

IN NO EVENT SHALL ABB, ITS SUPPLIERS OR SUBCONTRACTORS BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, including, but not limited to loss of profits or revenue, loss of use of the Equipment or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, downtime costs, delays, or claims of customers of the Purchaser or other third parties for such or other damages. ABB's liability on any claim whether in contract, warranty, negligence, tort, strict liability, or otherwise for any loss or damage arising out of, connected with, or resulting from the contract or the performance or breach thereof, or from the design, manufacture, sale, delivery, resale, repair, replacement, installation, technical direction of installation, inspection, operation or use of any equipment covered by or in connection therewith, shall in no case exceed the purchase price of the Equipment or part thereof or services which give rise to the Claim.

All clauses of action against ABB arising out of or relating to the contract or the performance or breach hereof shall expire unless brought within one year of the time of accrual thereof.

In no event, regardless of cause, shall ABB assume responsibility for or be liable for penalties or penalty clauses of any description or for indemnification of customer or others for costs, damages, or expenses each arising out of or related to the goods or services of the order.

Your local distributor or ABB office may hold different guarantee details, which are specified in the sales terms, conditions, or guarantee terms. These terms are available on request.

If you have any questions concerning your ABB frequency converter, please contact the local distributor or ABB office. The technical data, information and specifications are valid at the time of printing. The manufacturer reserves the right to modifications without prior notice.

Marine Applications – Technical Data

Ratings

The supply, braking and drive section tables in [ACS 600 MultiDrive – Technical Data](#) apply to marine applications with the following notes.

Note Concerning Height: The height in the tables does not include vibration dampers (18 mm at bottom and 72 mm on top of the cabinet). The additional height due to the dampers is 90 mm.

Note Concerning Depth: The basic depth of the cabinet without door devices is 600 mm. Additional 50 mm is required at the back and in front of the cabinet for the vibration dampers. Maximum depth (including flash barriers and hand grips on the door) is 758 mm.

Note: not all types are available for marine applications

Cabinet

The cabinet, degrees of protection and free space requirements for marine applications are listed below.

| ACx 600 Type | Enclosure | Degree of Protection | Space above mm | Space below mm | Space on left/right mm | Space in front/back mm |
|---------------------|-----------|-------------------------------------|----------------|----------------|------------------------|------------------------|
| ACS 600 MarineDrive | Cabinet | IP 22, IP 42, IP 54 R ¹⁾ | 500 | 0 | 0 | 200/100 ²⁾ |

¹⁾ R = air outlet duct

²⁾ 200 between rear plates of the cabinets when installed back to back

Ambient Conditions

The ambient conditions given in [ACS 600 MultiDrive – Technical Data](#) apply to marine applications with the following exception:

| Condition | Operation installed for stationary use | Storage in the protective package | Transportation in the protective package |
|----------------------------------|--|--|--|
| Vibration (IEC 68-2-6) | Amplitude ± 1,0 mm (5 to 13,2 Hz) Acceleration 7m/s ² (13,2 to 100 Hz) | Amplitude ± 1,0 mm (5 to 13,2 Hz) Acceleration 7m/s ² (13,2 to 100 Hz) | Amplitude ± 1,0 mm (5 to 13,2 Hz) Acceleration 7m/s ² (13,2 to 100 Hz) |

Applicable Standards

The ACS 600 MultiDrive for marine applications complies with the following standards:

- IEC 60092-302: 1997 Electrical installations in ships, low voltage switchgear and controlgear assemblies.
- EN 60204-1: 1992 + Corr. 1993 (IEC 204-1). Safety of machinery. Electrical equipment of machines. Part 1: General requirements.
- EN 60529: 1991 (IEC 529), IEC 664-1: 1992. Degrees of protection provided by enclosures (IP code).
- EN 50178: 1986. Electronic equipment for use in power installations.
- EN 61800-3 (1996): EMC product standard including specific test methods.

Materials

| Enclosure | Coating Thickness | Colour |
|---|-------------------|--------------------------------|
| Hot-dip zinc coated steel sheet 1.0 to 2,5 mm with polyester thermosetting powder coating (only in visible parts) | 60 µm | RAL 7035 light beige semigloss |
| Flat Busbars | | |
| Tin plated copper | | |
| Package | | |
| Wood or plywood (seaworthy package). Plastic covering of the package: PE-LD, bands PP or steel. | | |

Other Technical Data

See chapter [ACS 600 MultiDrive – Technical Data](#). The data for ACS 600 MultiDrive applies also to marine applications if specific data is not included in this chapter.



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